PROPOSED RESIDENTIAL ENERGY EFFICIENCY PLAN

HEARING

BEFORE THE

COMMITTEE ON FINANCE

UNITED STATES SENATE

NINETY-SIXTH CONGRESS

FIRST SESSION

ON

S. 1800

A BILL TO FACILITATE ENERGY EFFICIENCY IN RESIDENTIAL BUILDINGS

SEPTEMBER 26, 1979

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CONTENTS

PROPOSED RESIDENTIAL ENERGY EFFICIENCY PLAN

WEDNESDAY, SEPTEMBER 26, 1979

U.S. SENATE,
COMMITTEE ON FINANCE,
Washington, D.C.

The committee met, pursuant to call, at 2:10 p.m., in room 1114, Dirksen Senate Office Building, Senator Bill Bradley presiding.

Present: Senators Long, Bradley, Ribicoff, Boren, Roth, and Wallop.

[The press release announcing this hearing and the bill S. 1800 follow:]

PRESS RELEASE

FINANCE COMMITTEE ANNOUNCES HEARINGS ON PROPOSED RESIDENTIAL ENERGY EFFICIENCY PLAN

The Honorable Russell B. Long (D. La.), Chairman of the Senate Committee on Finance, today announced the Committee will hold a hearing on the proposed utility tax credit which is a part of a Residential Energy Efficiency Plan which has been offered by Senator Bill Bradley (D., N.J.) for consideration by the Committee during its deliberation on H.R. 3919, the Crude Oil Tax Bill.

The hearing will begin at 2:00 P.M., in Room 1114, Dirksen Senate Office Building on Wednesday, September 26, 1979.

The Residential Energy Efficiency Plan would provide for private energy conservation companies, under a government negotiated contract, to retrofit homes in order to make them more energy efficient. The private conservation companies would not be paid by the homeowners for the retrofitting but would be paid, on a predetermined rate based on actual energy savings obtained, from a revolving fund administered by the Federal Government. The revolving fund would be underwritten by government bonds and by assessments on private utility companies. The utility companies would be permitted to pass these assessments through to the utility company consumer. However, if the conservation program causes a revenue loss to the utility company because of reduced residential demand that cannot be immediately offset either by saving on fuel it no longer needs to buy or by finding new residential or commercial customers, a tax credit would be available. The amount of the credit would not exceed any residential tax increase which would otherwise have been necessary to offset the revenue loss. (Attached is a more detailed explanation of the proposed Residential Energy Efficiency Plan.)

Requests to testify.—Persons desiring to testify during this hearing must make their requests to testify to Michael Stern, Staff Director, Committee on Finance, Room 2227, Dirksen Senate Office Building, Washington, D.C. 20510, not later than the close of business on Monday, September 24, 1979.

Witnesses will be notified as soon as possible after this date as to when they are scheduled to appear. If for some reason the witness is unable to appear at the time scheduled, he may file a written statement for the record in lieu of the personal appearance.

Consolidated testimony.—The Committee strongly urges all witnesses who have a common position or the same general interest to consolidate their testimony and designate a single spokesman to present their common viewoint orally to the Committee. This procedure will enable the Committee to receive a wider expression of views than it might otherwise obtain. Further, all witnesses should exert a maximum effort to coordinate their statement.

Written statements.—Persons not scheduled to make an oral presentation, and others who desire to present their views to the Committee, are urged to prepare a written statement for submission and inclusion in the printed record of the hearing. These written statements should be submitted to Michael Stern, Staff Director, Senate Committee on Finance, Room 2227 Dirksen Senate Office Building, Washington, D.C. 20510, not later than Friday, September 28, 1979.

RESIDENTIAL ENERGY EFFICIENCY PLAN (PROPOSED BY SENATOR BRADLEY)

In general, the program would involve private energy conservtion companies retrofitting homes to make them more energy efficient. The conservation companies would not be paid by the homeowners but rather by a fund established for that purpose. The conservation companies would be paid at a predetermined rate negotiated with a government instrumentality and the company would be paid only for demonstrated energy savings resulting from retrofitting. Public utilities would be assessed for payments into the fund to pay the conservation companies.

Specifically, the Secretary of Energy, after consultation with utilities and Public Utilities Commissions, will designate a State, municipality or utility service area in which to implement the program. A government office or instrumentality, called the contracting agency, within the designated area will solicit bids from private energy conservation companies to perform residential retrofits. The contracting agency may be the Governor's office or the State Energy Department or a local government office.

The contracting agency will negotiate with the successful bidder to pay a predetermined price for energy actually saved by the conservation company. The energy conservation company will organize and manage the retrofit program. It will subcontract with local suppliers and installers and utilize retrofit experts to do systematic, block-by-block energy saving evaluations. The energy experts will also conduct training programs for employees recruited from the community to assist in performing the evaluations. The energy experts will come to homes and apartments within the designated area and offer to perform energy saving evaluations at no charge to the homeowner or residents. If a homeowner or resident gives permission, the energy expert will inspect the residence, identify sources of energy loss and prescribe individualized retrofit measures.

If the homeowner or resident gives permission, the energy conservation company will arrange and supervise the installation of the retrofit measures recommended by the energy expert. Neither the owner nor the resident (if the residence is rented) will be charged for the material and labor involved.

The contracting agency would also conduct independent pre-and-post retrofit audits to determine how much energy the conservation company actually saves. Following the retrofit and the determination of energy savings, the contracting agency will authorize payment from the fund to the conservation company at the predetermined negotiated rate.

The contracting agency then assesses the local utility companies for payment into the fund based on the value to the utility company of the energy saved from the retrofitting program. The value of the saved energy to the utilities would be measured by the marginal cost of the fuel or capacity it displaces. The contracting company will take into consideration in computing the value to the utility, for example, if the saved energy displaced the need for increased capacity by the utility. If the saved energy merely relieved the utility from purchasing additional fuel, then the value would be the cost of the fuel displaced.

TAX CREDIT

A tax credit would be provided to a public utility participating in a Federally contracted residential conservation program that can reasonably demonstrate that because of the installation of residential energy conservation measures, a net revenue loss has been incurred. The amount of the credit would not exceed any residential rate increase which would otherwise have been necessary to offset the revenue loss.

A public utility may not be able to immediately offset the revenue loss from reduced residential demand caused by an energy conservation program. If the revenue loss cannot be offset either by saving on the purchase of fuel no longer needed or by finding new residential or industrial customers, the utility would suffer a net loss. The tax credit is designed to apply only in those cases where there is a demonstrated net loss caused by the conservation program.

II

96TH CONGRESS
1ST SESSION

S. 1800

To facilitate energy efficiency in residential buildings.

IN THE SENATE OF THE UNITED STATES

SEPTEMBER 24 (legislative day, JUNE 21), 1979

Mr. BRADLEY (for himself, Mr. JACKSON, Mr. HATFIELD, Mr. BUMPERS, Mr. NELSON, Mr. FORD, Mr. MATSUNAGA, Mr. TSONGAS, Mr. BELLMON, Mr. WALLOP, Mr. PACKWOOD, Mr. DANFORTH, Mr. WEICKER, Mr. DOMENICI, and Mr. HEINZ) introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

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A BILL

To facilitate energy efficiency in residential buildings.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.—This Act may be cited as the "Residential Energy Efficiency Program of 1979".

SEC. 2. PURPOSES.—The purposes of this Act are—

(a) to reduce dependence on foreign oil supplies, and

(b) to protect residential consumers against rising energy costs by—

(i) increasing the efficiency of residential heating and cooling systems;

(ii) delivering effective conservation measures to residential consumers without charge; and

(iii) marketing the energy saved through residential conservation to utilities.

SEC. 3. Title II, part 1 of the National Energy Conservation Policy Act (Public Law 95-619, 92 Stat. 3206), as codified (42 U.S.C. 8201 et seq.), is amended by adding a new section 226:

"SEC. 226. ALTERNATIVE PROGRAM.—(a)(1) The Secretary on his own initiative, or upon petition of the Governor of any State, may institute, in cooperation with State and local governmental bodies and affected utilities, an alternative home energy efficiency program in any State, political subdivision, utility service area, or geographical area thereof, in accordance with the requirements of this section.

"(2) If an alternative home energy efficiency program is instituted, the requirements and prohibitions contained in part I of this title shall not apply to any person in any State, political subdivision, utility service area, or geographical area thereof in which such alternative program has been instituted.

"(b) REQUIREMENTS.—An alternative home energy efficiency program shall—

"(1) require the Secretary to designate a Federal State, or local government agency which shall—

"(A) negotiate a contract with an energy conservation company to undertake a home energy retrofit program as described in paragraph (2);

"(B) designate the geographical area in which residential buildings will be retrofitted pursuant to the contract;

"(C) establish with the approval of the Secretary the per unit price which the designated government agency will pay yearly during a twenty contract term for a given increment of energy (electricity, natural gas or oil) actually saved as determined in accordance with paragraph (3).

"(2) require an energy conservation company, as a condition of a contract, to agree to undertake a home energy retrofit program whereby the company—

"(A) utilizes home energy retrofit experts who shall offer to conduct systematic audits of all residential buildings designated in the contract without charge to the owners or occupants thereof;

54-726 O - 80 - 2

"(B) directs the home energy retrofit expert to enter a residential building upon permission of a resident, inspect the residence, identify residential energy conservation measures or load management techniques, or both, and prescribe such measures or techniques so as to maximize the amount of energy actually saved in relation to the per unit price to be saved;

"(C) arranges, upon obtaining permission of the owner and resident, for the supply and installation of prescribed residential energy conservation measures or load management techniques, or both, without charge to the owner or resident;

"(D) shall utilize, to the greatest possible extent, local suppliers and installers when supplying and installing prescribed measures and techniques; and

"(E) assures that such measures and techniques are properly installed and maintained during the reasonable life of the residential buildings in which such measures or techniques are installed.

"(3) require the designated Government agency to establish accurate normalized measurements, which may include a statistically reliable sample, of actual

energy use by type of energy before and after the installation of prescribed retrofit measures for an area designated in the contract referred to in paragraph (1). Such measurements shall measure actual energy savings produced by an energy conservation company under the contract for a reasonable period of time (not less than three years) following installation of energy conservation measures or load management techniques, or both.

"(c) FINANCING.—(1) The Secretary is authorized and directed to make funds available to designated Government agencies to meet their contractual obligations to pay energy conservation companies for energy actually saved as determined pursuant to subsection (b)(3).

"(2)(A) In order to have funds to meet obligations under paragraph (1), the Secretary is authorized and directed to require public utilities, after consultation with the State regulatory authority, to make periodic payments to the Secretary not to exceed the value of the savings in a given year that the utilities realized as a result of the energy actually saved.

"(B) As used in this section 'value of savings' shall include—

"(i) either—

"(I) the value of any savings in fuel minus any unavoidable costs;

"(II) the value of any savings in capacity minus any unavoidable costs; or

"(III) both (I) and (II).

"(ii) the selling price of conserved natural gas minus any unavoidable costs of selling the conserved natural gas or fixed charges to residential customers which would be assessed if such costs were not subtracted from the selling price.

"(C) Any payment under this paragraph shall be treated as if it were a cost of service.

"(D) Notwithstanding any other provision of law, a public utility, in order to maximize the value of savings, is authorized and directed to sell any energy available to it as a result of a home energy retrofit program at the highest price which a willing nonresidential buyer will pay for it.

"(3) If at any time the moneys available to the Secretary as a result of payments under paragraph (2) are temporarily insufficient to enable him to discharge his obligations under paragraph (1), he shall issue notes or other obligations to the Secretary of the Treasury repayable from future payments made pursuant to paragraph (2) in such forms and denominations, bearing such maturities, and subject to such terms and conditions as may be prescribed by the Secretary of the Treasury. Such obligations shall bear interest at a rate to be determined by the Secretary of the Treasury taking into

consideration the current average market yield on outstanding marketable obligations of the United States of comparable maturities during the month preceding the issuance of such obligations. The Secretary of the Treasury is authorized and directed to purchase any such obligations and for such purpose is authorized to use as a public debt transaction the proceeds from the sale of any securities issued under the Second Liberty Bond Act, as amended. At any time, the Secretary of the Treasury may sell any such obligations and all sales, purchases, and redemptions of such obligations by the Secretary of the Treasury shall be treated as public debt transactions of the United States.

"(4) The Secretary may not authorize any contract pursuant to paragraph (1) unless there is a reasonable likelihood total payments under paragraph (2) will exceed total payments under paragraph (1) by a margin substantial enough to cover those payments and retire any notes or other obligations issued to the Secretary of the Treasury pursuant to paragraph (3).

"(d) OTHER PROVISIONS.—

"(1) Prior to instituting any alternative program pursuant to this section, the Secretary shall publish notice of the intention to institute such a program and shall provide thirty days for public comment on such intention.

"(2) Any public utility required to make periodic payments pursuant to subsection (c) or any State regulatory authority may request the Secretary to adjust the amount of the payment on the basis that such payment exceeds the value of the savings the public utility would have realized but for the energy actually saved. The Secretary shall determine, in accordance with section 553 of title 5, United States Code, whether and to what extent such payment shall be adjusted.

"(3) As used in this section 'residential buildings' shall not be limited to four dwelling units as provided in section 210(9)(B).".

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Senator BRADLEY. The committee will come to order.

This afternoon, we are to hear testimony on residential energy efficiency program, S. 1800, which is before both the Senate Energy Committee, and the Senate Finance Committee. We have an outstanding list of witnesses who can shed light on this proposal and answer some of the questions that committee members have.

I will not delay the committee more. I will say that Senator Roth has to leave, and there is a representative from Delaware here whom he would like to introduce to the committee briefly.

Senator ROTH. Thank you, Mr. Chairman.

I do regret that because of other commitments, it is very unlikely that I will be able to be here when Mr. Wilner, who is the Public Advocate for the State of Delaware, will testify. But I was anxious to have the opportunity to personally introduce him to you, and to Senator Ribicoff, as well as other interested people here.

Evan Wilner is Delaware's first Public Advocate, and as such has spent a great deal of time on the issues of residential energy conservation and consumer rights. He has some very definite views, I think, on this proposal which will be of interest to the group here in trying to develop more constructive legislation.

I would ask Mr. Wilner if he would please stand so that everybody could meet him.

Thank you, Mr. Chairman.

Senator BRADLEY. Thank you, Senator Roth.

I would like to call as our first witness Mr. William Fischer, who is the Acting Assistant Secretary for Policy and Evaluation at the Department of Energy, with whom I have had the pleasure to talk and work on this proposal. I would like to introduce him now.

I understand, because this is a hearing that has been called in some haste in order to accommodate members of the committee, that Mr. Fischer's formal statement will be submitted to the record at a later point. He will speak extemporaneously from prepared notes. We understand that it is acceptable to submit that final statement to the record.

With him is Mr. Donald Lubick of the Treasury Department, who will comment on the tax aspect of this as well.

STATEMENT OF C. WILLIAM FISCHER, ACTING ASSISTANT SECRETARY FOR POLICY AND EVALUATION, DEPARTMENT OF ENERGY

Mr. FISCHER. Thank you, Senator Bradley.

My name is William Fischer, and I am the Acting Assistant Secretary of the Department of Energy for Policy and Evaluation. My testimony this afternoon will briefly describe the views of the Department regarding some of the recent proposals to encourage greater energy conservation in existing residential buildings. Specifically, I will describe the objectives which the administration believes should be given priority consideration in the development of these proposals. In addition, I will discuss our initial response to your proposal, Senator Bradley, that is encompassed in S.1800, and the proposals for increasing and expanding the residential energy tax credits that were enacted last year.

Assistant Secretary Lubick will address the tax credit provision, which I understand is under consideration in conjunction with S. 1800.

Before discussing these proposals, it would be useful to review quickly the status of the Nation's conservation efforts in existing homes and apartment buildings.

Today there are a little less than 50 million single-family homes, and about 25 million residential units and apartment buildings. About 15 percent of our total energy consumption is used to heat, cool and provide hot water for these residences.

We believe there is the potential to reduce this energy use by up to 50 percent, saving the equivalent of up to 2 million barrels per day of oil and gas. Achieving these savings, however, would require total private and public investments of as much as $100 billion in insulation and other energy conserving measures. It will take a considerable period of time to complete these investments to the optimum level.

In response to rising energy prices, and existing Government programs, these investments gradually are being made by homeowners. In each of the last 2 years, roughly 6 percent of all occupied one to four-family residences have made an average of $700 worth of conservation investments, a total of at least $4.2 billion.

Although impressive, this level of investment is far from the level necessary to achieve the full potential for conservation savings. Current estimates indicate that the average cost effective conservation investment should be closer to $1,500 per house. At the present time, perhaps 20 percent of homes have no insulation at all, and over 50 percent have inadequate insulation.

In order to further increase conservation efforts in residences, the administration believes that we must both strengthen existing conservation programs and institute new programs where appropriate. Currently there are three major programs designed to achieve conservation in existing residences.

First, there is the 15-percent residential energy tax credit, which was enacted last year, under which we have now the first full year's experience.

Second, there is the weatherization grant program for low-income families.

Third, there is the Residential Conservation Service program enacted by the Congress, which will go into effect sometime next year.

The Residential Conservation Service program will require utilities to offer on-site audits to customers in one- to four-family homes. The utilities will also offer lists of contractors and lenders, and offer to arrange for installation and financing of conservation measures.

The current law prohibits utilities from actually installing measures, or lending money, except in certain specified cases.

In developing more effective programs in this area, we believe careful consideration should be given to five objectives which address factor impeding the rate of retrofit in areas in which improvements could be made. A major factor which seems to be impeding progress toward full exploitation of energy conservation in residences is the high initial cost of conservation investments,

which is often a barrier to homeowners, particularly those with moderate or low incomes. Thus, first, we must insure that homeowners have adequate financing arrangements.

Second, additional financial incentives within reasonable financial limits, can make more attractive a higher and faster rate of conservation investments by moderate and low income families.

Third, homeowners must be given easy access to information and assistance designed to insure that their investments save energy and are cost effective.

Fourth, where appropriate, we should rely on the utilities' responsibility, which was imposed by the Congress last year, to provide conservation assistance to homeowners.

Finally, States and other institutions should be encouraged to develop and implement innovative programs to facilitate conservation investment in existing residential buildings.

I believe these objectives are consistent with several recent proposals in this area, including those that the President proposed in his July 15 message. We want to work with the Congress, especially with the Senate, because of the many proposals that have been offered recently, and we hope to be able to reach an agreement on the specifics of a mutually satisfactory and effective proposal.

I would like to address briefly the proposal, Senator Bradley, which you have recently made, and the tentative agreement that has been reached by the Finance Committee to increase and expand the coverage of residential energy tax credits.

Over the past 2 months, we have had several discussions with Senator Bradley and his staff to explore the implications of the proposal that he has set forth. We have also had discussions with other Senators and Members of Congress who have advocated different legislative proposals.

There are many aspects of the proposal contained in S. 1800 which are both innovative and very appealing. The energy conservation companies which are at the heart of S. 1800 hold the potential for being an effective and efficient mechanism for actually achieving energy savings in residences.

The energy conservation companies would be authorized under the bill to provide a systematic, area-wide service to winterize residences at limited or no cost to the homeowner. In order to make available this service, while minimizing cost to the homeowner, the proposal relies on the unique financing mechanism which includes both Government agencies and local utilities.

As we understand it, the plan relies on a combination of utility payments and, perhaps, supplemental charges to homeowners to cover the full cost of conservation investments. Government agencies, called contracting agencies, would contract with energy conservation companies to make annual payments for the energy actually saved by the company in residences.

The Government would, in turn, require utilities to make payments to the Secretary through a revolving fund which reflect the actual savings realized by the utility. The government would be responsible for insuring that there is a reasonable likelihood that utility payments will equal or exceed the payments to the energy conservation companies.

54-726 O - 80 - 3

Our preliminary analyses indicate that a large number of electric and natural gas utilities may not be able to cover all of this cost without significantly increasing utility rates to their ratepayers. Perhaps these increases could be limited to those ratepayers who received the direct conservation services.

It is possible that the result of such special charges would be that those ratepayers who actually received the conservation services from the energy conservation company would still be net gainers compared to the costs that they would otherwise have incurred.

The concepts and calculations involved in this analysis are very complex. They involve forecasting over a period of 20 years what the relative costs for conservation are, and what the relative savings are in the fuels that are displaced by the conservation efforts.

We are now performing a more sophisticated review of several specific utilities. I believe there are five involved in the current review.

If our initial analysis is confirmed, the financing mechanism may have to be strengthened, for example, by providing for the recovery of part of the costs from households which benefit most directly from the conservation measures.

We understand that Senator Bradley has already contemplated optional mechanisms along this line to strengthen the bill, if that proves to be necessary.

While our analysis today indicates that some modifications may be necessary, I understand from conversations with Senator Bradley that those are implicitly contemplated, although not explicit in the language of the bill at the present time.

Nevertheless, even though some modifications may have to be made, we are still very interested in seeing if this imaginative approach can be a significant and expensible part of an enhanced residential conservation program.

Although it is untried as yet, the plan contained in S.1800 is an intriguing mechanism which may significantly accelerate energy conservation in existing homes.

We believe any legislation that is eventually adopted should provide authority for areas of the country to adopt this approach, and a requirement that the Federal Government work with some State and local governments and affected utilities to develop, to the extent practicable, financially viable, full-scale test implementation programs, which if successful could be replicated in other areas of the country. At this time, however, we believe there are too many uncertainties regarding this concept to base the entire national energy conservation program for residences exclusively on this concept.

While I am on that point of exclusivity, I would like to mention one other concern that we have, that I don't have the full answer to today, Senator Bradley, and that is the exclusive nature of a contract with an energy conservation company.

It seems to me there is a potential there for anticompetitive effects. I don't know the full ramifications of these possible effects, so I have asked the Antitrust Division of the Department of Justice to give us their advice as quickly as they can on this issue.

Perhaps, you have already contemplated this concern, but I thought that I should raise it.

One of the more conventional approaches to encouraging energy conserving investments, of course, is the provision of tax credits. In recent weeks, a number of proposals have been made to increase substantially the existing 15 percent tax credit for conservation investments, and to expand the list of eligible measures.

We have recently undertaken, in cooperation with Mr. Lubick's office in the Treasury Department, an analysis of the likely revenue and energy effects of these tax credits. We will make available the results of this analysis as it is completed.

During your consideration of such tax credits, however, I believe that it is important for the committee to recognize some of the reasons why their effectiveness may be limited.

First, a major factor inhibiting conservation investments by homeowners, particularly moderate to low-income homeowners, is the high initial cost of conservation investments.

Federal subsidies, such as tax credits, that reimburse homeowners for only a portion of the initial cost cannot eliminate the need for homeowners to raise the upfront money for the investment. This problem has been confirmed by preliminary examination of 1978 tax returns, which indicate that about 80 percent of the persons who claimed the residential energy credit had incomes greater than $15,000. The administration believes that consideration should be given to Federal incentives in addition to tax credits that might more effectively reach moderate to low-income families.

Second, the existing tax credits rely on an established list of eligible energy conservation measures. The homeowner must determine which of these measures, if any, are needed for his or her home. Conventional information programs generally are not sufficient to provide homeowners with the analysis of their home which is required before a major conservation investment can be made.

The residential conservation service, authorized by the Congress, will implement the law that requires utilities to offer home-energy audits, and other conservation services to homeowners. We should consider the desirability of linking further Federal incentives to the performance of high quality energy audits.

Although the tax credits offer the advantage of simplicity, I believe the two deficiencies I have outlined argue strongly for further consideration of alternative incentives.

In closing, let me again emphasize that we hope to work cooperatively with this committee and the Congress to develop a mutually acceptable and effective conservation program for existing residences.

I would now be happy to respond to any questions.

[The prepared statement of Mr. Fischer follows:]

STATEMENT OF C. WILLIAM FISCHER, ACTING ASSISTANT SECRETARY FOR POLICY AND EVALUATION, DEPARTMENT OF ENERGY

My name is William Fischer, and I am the Acting Assistant Secretary of the Department of Energy for policy and Evaluation. My testimony this afternoon will briefly describe the views of the Department regarding some of the recent proposals to encourage greater energy conservation in existing residential buildings. Specifically, I will describe the objectives which the administration believes should be given priority consideration in the development of these proposals. In addition, I will discuss our initial response to your proposal, Senator Bradley, that is encompassed in S. 1800, and the proposals for increasing and expanding the residential energy tax credits that were enacted last year.

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In response to rising energy prices, and existing government programs, these investments gradually are being made by homeowners. In each of the last two years, roughly 6 percent of all occupied one- to four-family residences have made an average of $700 worth of conservation investments, a total of at least $4.2 billion.

Although impressive, this level of investment is far from the level necessary to achieve the full potential for conservation savings. Current estimates indicate that the average cost effective conservation investment should be closer to $1,500 per house. At the present time, perhaps 20 percent of homes have no insulation at all, and over 50 percent have inadequate insulation.

In order to further increase conservation efforts in residences, the Administration believes that we must both strengthen existing conservation programs and institute new programs where appropriate. Currently there are three major programs designed to achieve conservation in existing residences.

First, the 15 percent residential energy tax credit, which was enacted last year, under which we have now the first full year's experience.

Second, the weatherization grant program for low-income families.

Third, the Residential Conservation Service program enacted by the Congress, which will go into effect sometime next year.

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The current law prohibits utilities from actually installing measures, or lending money, except in certain specified cases.

In developing more effective programs in this area, we believe careful consideration should be given to five objectives which address factors impeding the rate of retrofit in areas in which improvements could be made. A major factor which seems to be impeding progress toward full exploitation of energy conservation in residences is the high initial cost of conservation investments, which is often a barrier to homeowners, particularly those with moderate or low incomes.

The first objective, therefore, is to ensure that homeowners have access to financing arrangements that will enable them to undertake such investments without large initial payments.

Second, additional financial incentives, within reasonable financial limits, can make more attractive a higher and faster rate of conservation investment, particularly by moderate and low income families.

Third, homeowners must be given easy access to information and assistance designed to insure that their investments save energy and are cost effective.

Fourth, where appropriate, we should rely on the utilities' responsibility, which was imposed by the Congress last year, to provide conservation assistance to homeowners.

Finally, states and other institutions should be encouraged to develop and implement innovative programs to facilitate conservation investment in existing residential buildings.

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The energy conservation companies would be authorized under the bill to provide a systematic, area-wide service to winterize residences at limited or no cost to the homeowner. In order to make available this service, while minimizing cost to the homeowner, the proposal relies on the unique financing mechanism which includes both government agencies and local utilities.

As we understand it, the plan relies on a combination of utility payments and, perhaps, supplemental charges to homeowners to cover the full cost of conservation investments. Government agencies, called contracting agencies, would contract with energy conservation companies to make annual payments for the energy actually saved by the company in residences.

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The concepts and calculations involved in this analysis are very complex. They involve forecasting over a period of 20 years what the relative costs for conservation are, and what the relative savings are in the fuels that are displaced by the conservation efforts.

We are now performing a more sophisticated review of several specific utilities. I believe there are five involved in the current review.

If our initial analysis is confirmed, the financing mechanism may have to be strengthened, for example, by providing for the recovery of part of the costs from households which benefit most directly from the conservation measures.

We understand that Senator Bradley has already contemplated optional mechanisms along this line to strengthen the bill, if that proves to be necessary.

While our analysis today indicates that some modifications may be necessary, I understand from conversations with Senator Bradley that those are implicitly contemplated, although not explicit in the language of the bill at the present time.

Nevertheless, even though some modifications may have to be made, we are still very interested in seeing if this imaginative approach can be a significant and expensible part of an enhanced residential conservation program.

Although it is untried as yet, the plan contained in S. 1800 is an intriguing mechanism which may significantly accelerate energy conservation in existing homes.

We believe any legislation that is eventually adopted should provide authority for areas of the country to adopt this approach, and a requirement that the Federal government work with some state and local governments and affected utilities to develop, to the extent practicable, financially viable, full-scale test implementation programs, which if successful could be replicated in other areas of the country. At this time, however, we believe there are too many uncertainties regarding this concept to base the entire national energy conservation program for residences exclusively on this concept.

While I am on that point of exclusivity, I would like to mention one other concern that we have, that I don't have the full answer to today, Senator Bradley, and this is the exclusive nature of a contract with an energy conservation company.

In fact, the Department of Justice has suggested that competitive problems would be raised. We are currently exploring ways to mitigate such problems. We hope that any legislation incorporating the Bradley plan will be drafted in such ways as to permit maximum flexibility in implementation. In this way, there would be sufficient leeway to address our concerns about competition.

Perhaps you have already contemplated this concern, but I thought that I should raise it.

One of the more conventional approaches to encouraging energy conserving investments, of course, is the provision of tax credits. In recent weeks, a number of proposals have been made to increase substantially the existing 15 percent tax credit for conservation investments, and to expand the list of eligible measures.

We have recently undertaken, in cooperation with Mr. Lubick's office in the Treasury Department, an analysis of the likely revenue and energy effects of these tax credits. We will make available the results of this analysis as it is completed.

During your consideration of such tax credits, however, I believe that it is important for the committee to recognize some of the reasons why their effectiveness may be limited.

First, a major factor inhibiting conservation investments by homeowners, particularly moderate to low-income homeowners, is the high initial cost of conservation investments.

Federal subsidies, such as tax credits, that reimburse homeowners for only a portion of the initial cost cannot eliminate the need for homeowners to raise the upfront money for the investment. This problem has been confirmed by preliminary examination of 1978 tax returns, which indicate that about 80 percent of the persons who claimed the residential energy credit had incomes greater than $15,000. The Administration believes that consideration should be given to Federal incentives in addition to tax credits that might more effectively reach moderate to low-income families.

Second, the existing tax credits rely on an established list of eligible energy conservation measures. The homeowner must determine which of these measures, if any, are needed for his or her home. Conventional information programs generally are not sufficient to provide homeowners with the analysis of their home which is required before a major conservaiton investment can be made.

The residential conservation service, authorized by the Congress, will implement the law that requires utilities to offer home-energy audits, and other conservation services to homeowners. We should consider the desirability of linking further Federal incentives to the performance of high quality energy audits.

Although the tax credits offer the advantage of simplicity, I believe the two deficiencies I have outlined argue strongly for further consideration of alternative incentives.

In closing, let me again emphasize that we hope to work cooperatively with this committee and the Congress to develop a mutually acceptable and effective conservation program for existing residences.

Senator BRADLEY. Thank you very much, Mr. Fischer. I think we will suspend Mr. Lubick's opening statement, and just get to questions, if that is all right with you. You can submit it for the record.

Mr. LUBICK. I do not have an opening statement, but I have a few remarks that I would like to make, if that would be all right, that might lead into questions.

Senator BRADLEY. Fine.

STATEMENT OF HON. DONALD C. LUBICK, ASSISTANT SECRETARY FOR TAX POLICY, DEPARTMENT OF THE TREASURY

Mr. LUBICK. Mr. Chairman, from the point of view of the Treasury Department, our expertise in dealing with this plan is rather limited. There is one tax credit, and I would like to make some comments on that. But more important than that, the fact that there is only one tax credit and that the bulk of the plan does not rely on the tax system, I think, is worthy of comment by the Treasury Department, because we believe it indicates an approach which is much superior to the use of the tax route to accomplish its major purposes for two reasons: one is cost efficiency, and the other is administrative efficiency.

In that connection, the weatherization programs which are undertaken through your program are going to be supervised by persons who are expert in determining the needs of individual home-dwellers, and the needs and the efficiency of the service performed.

The Internal Revenue Service is simply not equipped to make determinations that have been thrust upon it in this area, to determine the energy efficiency of particular improvements that have been made, whether they are the best ones that have been made, whether they have been made in the proper way to secure the energy savings.

Therefore, we very heartily approve of the general approach which you have taken as accomplishing the objective of actually securing the energy savings as opposed to running it through the tax system, where actually the rate of audit by the Internal Revenue Service in this whole area is at best two percent, so that it is very hard to see that through supervision we can make sure that there actually are energy savings produced through the tax credit mechanisms.

Second, and this is a corollary of the first, the administration of the program requires the audit. I believe that in the 1978 tax returns there were over 5 million returns which claimed these credits. There is just no way in which the service can undertake efficient administration of a program of that magnitude.

The particular tax credit that you have included in your program requires the Service to deal with only 5,000 taxpayers who are utilities, and the Service is most likely going to be auditing these taxpayers anyway.

They are taxpayers who are in a regulated industry that has excellent and detailed recordkeeping requirements, so the job for us to undertake the particular tax credit that you have suggested here is one that is very manageable and stands up as one that can be handled administratively and efficiently, so long as we are dealing with records and figures that fit right into the accounting background of our particular auditors.

There are just a couple of questions that I would like to raise, and I am sure these are matters which will have to be worked out in cooperation with you in the drafting of the credit which you have proposed to insure the utilities against loss where they are unable to resell the saved energy at more than the cost that they were incurring anyway.

We want to make sure that there is no incentive for the utilities, and the utility commissions, simply to pass on all these extra costs to the Federal Government. We have to have some assurance along those lines. We have run into some difficulties with respect to congressional enactment of investment credits and accelerated depreciation where utility commissions have attempted to do something which Congress did not intend; namely, make the pass-through.

The only other aspect that gives us some concern is that we have to make sure there is a mechanism for determining whether the utility actually has a net loss from the particular program. In other words, there has to be a method of establishing the base for determining gain or loss. There has to be a method of determining the residential rate increase that would otherwise have been necessary to offset the revenue loss, the upper-limit.

These are technical questions that we would look forward to working with you on. Once we are able to establish what the amount of the revenue loss is, and the reimbursement, we think

that it is a highly soluble problem to work out these details of the administration.

Senator BRADLEY. Thank you very much, Mr. Lubick.

I would like now to ask just a few questions.

Mr. Fischer, in my conversations with the administration, Secretary Duncan and Mr. Sawhill as well as the previous regime, I have gotten my own impression as to the commitment that they have to residential energy conservation.

I would like to know what your opinion is. Is this administration, and is your Department under the new regime, committed to passing an energy conservation piece of legislation with the windfall profits tax or the synfuels bill?

Mr. FISCHER. Yes, sir.

Senator BRADLEY. In your statement, you talked about some of the barriers and some of the elements of a successful residential energy efficiency program. I wonder if you could reiterate what you think are the indispensable elements in a residential energy efficiency program.

I know you talked about the need for overcoming the financial hurdle, the low cost, and the delivery mechanism. I wonder whether you would just expand on those elements again?

Mr. FISCHER. I think that experience has shown that one of the barriers, expecially in the moderate to low-income area, is the high initial cost of conservation investments. Secondly, additional financial incentives, beyond what now exists, would seem to be desirable.

Senator BRADLEY. So you would say that low cost is important to a successful residential energy efficiency program. You would say that the achievement of maximum savings is important. Wouldn't you say that?

Mr. FISCHER. Yes.

Senator BRADLEY. Would you say that there should be equity among homeowners and renters, as well, as a component?

Mr. FISCHER. It is always a desirable goal, Mr. Senator.

Senator BRADLEY. Would you also say that avoiding rate increases, to the extent possible, is an important element of any residential energy efficiency program, or at least rate increases that are more than they would be otherwise?

Mr. FISCHER. Yes.

Senator BRADLEY. So that when you come down to the question of elements in a successful, as well as impediments to successful energy conservation in the residential sector, you really boil down to overcoming the financial hurdle in establishing the delivery mechanism for maximum penetration of the market. You want to deliver to the consumer the maximum savings in the shortest possible time, at the lowest possible cost to him as a taxpayer. Would you agree?

Mr. FISCHER. I would, Mr. Chairman, and I think I would add to that one of the key elements should be financial viability. Whatever the mechanism is, it should be demonstrated to be financially viable over the time period involved.

Senator BRADLEY. Is it your judgment that tax credits, or grants, or loan programs, or programs that empower utilities to loan money to consumers, will be adequate to promote the country's

interest in residential energy efficiency, and penetrate the marketplace in the shortest period of time?

Mr. FISCHER. I would hesitate, Mr. Chairman, to have the total program rely on any single mechanism. Availability of credit through institutional structures that already exist is a desirable thing, but I would think that we should use every innovative and imaginative approach we can, because I doubt that any one mechanism is sufficient. For example, in the very low-income areas, it is fairly clear that loan programs are not an adequate mechanism by themselves.

Senator BRADLEY. All the things that I mentioned, loans, grants, and the utility approach depend on one common element—I hope we will concur in that—and that is consumer initiative. The consumer has to initiate the whole process. He has to ask for an audit. He has to ask for financing. He has to choose and seek those people who will install energy efficiency equipment in his home. Would you say that to date, this matter has been particularly encouraging?

Mr. Fischer: It is certainly more encouraging than what we had 5 years ago. That, of course, has been helped, in part, by the rising cost of energy, and the scarcity on the world market, especially of petroleum products. I would think that we need to do more than we have done in the past along these lines.

I think that depending upon consumer initiative is a difficulty and at the same time it is a bit of a blessing. We need to preserve for the consumer an element of choice, also.

Part of the rationale behind the recently enacted Residential Conservation Service is to require utilities to offer an audit service in a more aggressive way. Once that audit has been performed, the consciousness of the consumer or homeowner of the potential savings is greater.

Senator BRADLEY. As you know, Mr. Fischer, I am perfectly willing to compete. I think if the residential consumer has a choice, a loan he will have to repay at the time he sells his home, plus pay interest through the rate base—and even if he is not even the person who is doing it, he will still be affected through increased rates if he depends on a grant he still has to initiate the process. I would take my chances between those approaches, and mine in which someone knocks on your door and says: "We are here to perform an audit of your home to determine what you need to save energy, and install that energy free of charge to you, with no direct cost." I would be more than willing to compete.

I think that the question here is the delivery system of the residential energy efficiency program. I would just like to ask you this: Do you think that the residential energy efficiency program would maximize the use of conservation in the home if it can be proved workable in a test environment?

Mr. FISCHER. Given your premise, Mr. Chairman, I don't think there is much question. If what is being offered is a no cost installation of adequate conservation materials, devices, and measures in the home, as opposed to a partial grant for the cost, or a loan for the cost, it would not be hard for any of us to choose. But that premise is part of our caution on this, and I know that it is part of yours, and that is what is behind this notion of providing the

authority to demonstrate whether this device is, in fact, competitive, or clearly superior. That conclusion will depend on the calculations that need to be performed to demonstrate the financial viability.

There are some questions about that conclusion. We are pursuing them, and we will be working with you. I think that at this stage it would be a mistake to rely solely on this device. I think the notion of having it in competition with other measures, which are now having a significant effect according to the latest figures, would be desirable.

Senator BRADLEY. Would be what?

Mr. FISCHER. It would be a mistake to rely totally on your device, supplanting these other measures. The idea of competition is a good one, I think.

Senator BRADLEY. What benefits do you see the utilities getting from the residential energy efficiency program?

Mr. FISCHER. Obviously, if a utility is able to avoid the marginal costs of additional capacity construction, that is a saving to them which they could pass on to the ratepayer. Furthermore, if the total amount of power or fuel used to generate current load could be reduced, that would be a savings to them.

Senator BRADLEY. What about their ability to plan for growth and demand? As it is now, they have to build a new powerplant, and a new power in excess of their needed demand. With this plan, they would be able to decide to achieve a 10, 15, 20, or 30 percent reduction within their existing capacity through the residential energy efficiency program. It allows them to plan more precisely. Would you agree with that?

Mr. FISCHER. If the calculations can be made with adequate certainty over the time period we are talking about, it certainly would help them in their planning. But I don't want to minimize the difficulties and complications of those calculations.

Senator BRADLEY. One last question. Do you think that the residential energy efficiency program would be less costly to the Federal Government than other plans that we have been considering?

Mr. FISCHER. Once again, Mr. Chairman, based on the premise that the conservation investment could be entirely paid for by the energy saved, it certainly would be less costly.

Senator BRADLEY. Or if the cost to any Federal entity, or to the Federal Government, would be less than the cost of any other program. A grant program, a tax credit program, a loan program, all have a certain cost to the Federal Government, so anything up to that cost——

Mr. FISCHER. You are pushing me very hard, Mr. Chairman, and I think that that is proper, but it pushes me to look at that section in the bill which opens up a contingent liability on the Treasury in the form of tax expenditures through credits advanced to utilities in the event that the savings are not realized to a level that equals the investment cost. If they are not, then there is a potential liability on the Treasury in the form of a tax expenditure.

So once again, based on the premise that the savings would equal the costs levelized over the time period involved, it certainly would be less of an exposure than the direct grant program.

Senator BRADLEY. Senator Ribicoff, do you have any questions?

Senator RIBICOFF. Have 15 more minutes, and I would like to ask one question of whoever represents the utilities?

Senator BRADLEY. That is who we are going to get to right now. There are no other questions. Thank you very much, gentlemen.

I would like to call Mr. Bartnoff to testify.

I would like to welcome Mr. Shepard Bartnoff, the president of Jersey Power & Light, to the committee.

Dr. Bartnoff, I know that you have a prepared statement, but Senator Ribicoff has to leave. So prior to your opening statement, perhaps you could answer any question that he might have? Sen. Ribicoff is very interested in nuts-and-bolts questions.

STATEMENT OF SHEPARD BARTNOFF, PRESIDENT, JERSEY POWER & LIGHT

Mr. BARTNOFF. Very well.

Senator RIBICOFF. I see here, Mr. Bartnoff, that your utility serves about half of New Jersey.

Mr. BARTNOFF. Half of the area.

Senator RIBICOFF. How many homes are there involved?

Mr. BARTNOFF. We have about 600,000 residential customers.

Senator RIBICOFF. In case a pilot program was initiated and the Jersey Power & Light Co. were designated to conduct the pilot program, how would your utility company go about placing the Bradley plan into effect?

Mr. BARTNOFF. If a portion of our service area were selected for a pilot program, I think our procedure would be as is outlined in the legislation, which the Senator introduced.

We would be, in a sense, Senator Ribicoff, merely a recipient of some of the benefits, in that since we are an energy deficient company, we could immediately stop buying some energy from outside to serve our customers.

But in terms of the actual implementation, I think that the plan has many good points in that it does not put us, as a utility, either in the banking business or in the construction business, or in the insulation business.

Senator Ribibcoff: But how would you assume responsibility, if any, for the contracting companies, the energy conservations companies that are going to serve your customers and do a good job? Who will make that determination as to X company?

Mr. BARTNOFF. It is my understanding that the determination for the performance of the energy conservation company will be by the Government agency that gives the company the contract, and which does the auditing of that company, or handles the independent auditing of the energy conservation company.

Senator RIBICOFF. So the utility company would have no connection at all with the contracting company?

Mr. BARTNOFF. That is my understanding, and to us this is one of the benefits of the plan from the narrow, utility-selfish point of view.

Senator RIBICOFF. I know, from the narrow standpoint, but don't you believe that the average homeowner would assume that the utility company with whom he has been doing business for many years would sort of be a guarantor of the type of work. Whether

you were or not, they would assume that the utility company was a lead player in this proposal?

Mr. BARTNOFF. Senator Ribicoff, I think there is bound to be some of that assumption. But compared with other plans, I think this has the big advantage. If we have a plan where it is the utility company which performs the audit, where it is the utility company that arranges for the insulation for the energy conservation, or whatever it is that needs to be done, then whether it is, indeed, a utility responsibility or not, the average homeowner, the consumer will look to the utility for that responsibility.

In this case, where the utility is not the agency which arranges any of these things, there is less danger of what you are saying.

Senator RIBICOFF. Does your utility just sell electric power, or do you also sell gas?

Mr. BARTNOFF. Our particular utility has only electricity.

Senator RIBICOFF. So some of your customers would use electricity for lighting their homes, some would use it for heating, some would use it in connection with gas, some would have an all-electric home. How would you allocate the various savings to the various types of customers?

Mr. BARTNOFF. You have touched on one of the questions, Senator, which I myself have asked. This is not spelled out clearly in the legislation. But I am sure that for a home which has both gas and electricity as the two energy utilities, an equitable arrangement could be worked out for that allocation.

There is in the bill, as it has been presented, some suggested formula for savings that would ensue to an electric utility, which are electric savings, and one for the gas utility, which are the gas savings. These could be either to both of them, or there could be a sharing between the two. This is a detail, and there are many such details which I feel need to be worked out in the implementation of the legislation. I don't think that it is important relative to the overall energy conservation program.

Senator RIBICOFF. These are important because you are starting a completely new proposal, and I commend Senator Bradley for having conceived it, but yet the implementation does become important as to whether this is a successful or unsuccessful plan.

If you have some 600,000 homes, how would you go about placing this proposal in effect in your area? How would you determine which town, or which block, or which country you would put it in effect? How would you make that initial choice?

Mr. BARTNOFF. That initial choice will have to be made by some arbitrary decision. Obviously for a pilot program, an area which covers half the State, and has, as I stated, 600,000 residential customers, is rather big. But we have in our company a division of some six districts and, perhaps, one of those six, or a portion of one might do, I hate to mention a name, because then the residents of that particular section would feel that perhaps they are honored, and the other sections feel, perhaps, "Why should we wait for a program to be implemented?" We can find a suitable section, of a suitable size, with a suitable number of customers, where the program as outlined by the Senator, the energy company coming in, performance of the audit on a house-by-house, block-by-block basis could be done.

Senator RIBICOFF. I don't want the name of the unit that you would choose, but your estimate of the number of homes in the viable unit that you would choose?

Senator BRADLEY. I think your question is, How do you decide where you operate? How do you decide where to insulate the homes?

Senator RIBICOFF. I don't care about that.

Senator BRADLEY. He does not make that decision.

Senator RIBICOFF. No; but if he is going to have a pilot program, it is obvious that you are not going to be able to do at one time 600,000 homes. If you tried, you would fall on your face.

I am just curious, from your experience, what size of a pilot program would you start with?

Mr. BARTNOFF. We have here a basis of experience for a program such as this which is zero. I would hazard a guess that perhaps a group of somewhere between 10,000 and 25,000 homes might be one that is representative, and might one where we could work the thing out, see what wrinkles there are that need smoothing out, and in a very short period of time have a program going, and encounter these problems so we can work on them.

Senator RIBICOFF. With 10,000 or 25,000 homes, could you measure the savings through this plan if you had a pilot program of that size?

Mr. BARTNOFF. This is an area where I would have some questions of the Senator and his staff, and his consultants. I think that you hit on a very important segment of the overall plan, the determination of what are the energy savings. And this is a really vital part because the earnings of the energy company are based upon these energy savings, and if the estimate that is going to be made of those is too high, then, of course, that energy company will receive windfall profits. If the estimate of the payment to the energy company is too high, we might even reach a point where the savings do not warrant the expenditure of the energy improvements.

However, I am convinced that even if the estimates that are mentioned by Senator Bradley in his description of the plan of somewhere between 40 and 50 percent potential savings, if these estimates are high, and personally I think they are high, even if it is only 25 percent, which is very reasonable, there is energy to be saved.

Senator RIBICOFF. I know, but what I am getting at is, how would you as a utility make the determination why you save 20, 25, 30, or 10 percent? I am just curious, would that be difficult for you to determine?

Mr. BARTNOFF. Under the plan, the utility would not make that determination.

Senator BRADLEY. I would just like to interrupt and clarify.

The question of whether you would work with 25,000 homes is not a decision that is taken by the utility. The decision on the size of the market is taken by the energy conservation company. It determines how much it can do, given its manpower capacity, given its capital. If it decides that it can do more than 25,000, it takes that on, because this is all at its own risk. It does it all with upfront money. There is no charge to the utility until 1, 2 years

later, when it has been confirmed that savings have actually occurred.

So that the size of the initial area is dependent on the energy conservation company. To our purpose, it is important to get the largest area possible. I understand that there are certain managerial limitations to that. But I don't think that Mr. Bartnoff can tell you because he has never done that.

Senator RIBICOFF. No one else has either.

Senator BRADLEY. That is right.

Senator RIBICOFF. I think the whole problem you have here, many of the abuses that have taken place in the whole reconstruction field are by companies who sell, whether it is siding, shingles, or insulation. As you know, the business bureaus have been struggling with this problem for decades.

What we want to make sure is how this works out, since it has not been tried. To take a program like this for the entire country, in my personal opinion, would be wrong. I am trying to figure how big of a size, or how small of a size could you get a real pilot test before you put it into effect.

Senator BRADLEY. I would suggest that you would look in various areas of the country that have different utility structures, and different construction patterns. You, indeed, might test it in three or four areas of the country. I think that it is arbitrary to place a number of households as a limitation, though. That is my own view.

Mr. BARTNOFF. One of the features that attracted me as an individual and a homeowner, as opposed to being the president of a utility, is that the plan depends on payments to the energy conservation company, not on their capital investment, not on the dollars that they put in, but on the energy that they save. Therefore, there is a real incentive to that company to save as much energy as possible at minimum cost.

The CHAIRMAN. May I ask a question at this point, and get in on this?

Here is a thought that occurs to me, and I think you have probably thought about this. I have not thought it through that much. This sounds to me like something that if it works, it is a terrific idea. If it does not work, it is just like anything else that does not work.

We had demonstrated before us, when we were considering the energy bill a couple of years ago in the Finance Committee, a little device that someone had invented. You put it right inside the house. It is a meter, which lights up electronically, and it shows how much it is costing you for all the devices inside your house. If it was a completely electric house, it could all be done on one meter. If you have the stove burning, and you have all the equipment going, the dials just roll over, and makes you feel like you are in one of those taxicabs where you are not sure you are going to have enough money to pay if you are in it that much longer.

What do you do? Obviously, you start shutting things off, cut off the thermostat in all the rooms except the one you are in, and then the next thing you know you become cost conscious, and you say: "Think of all the money I would save if I would just get myself a

set of long underwear, and instead of sitting here in a bathrobe, put on an overcoat when I am sitting here watching television."

The fellow then, induced by that little device that shows him how much it is costing him, proceeds to really save a lot of money, so he sleeps under about three blankets, plus a comforter. Then he proceeds, as I said, to sit and watch his television with a pair of galoshes and an overcoat on.

Do you think the company that put that little device in would be entitled to claim payment for all the energy this guy saved because it changed his habits?

Mr. BARTNOFF. I think that the device that you mentioned would certainly be an incentive for anyone who has it to stop the little dials from turning as much as possible, unless you are one of those fortunate individuals with so much money that it does not matter, and there are not many of us who are in that situation.

What we are really looking for here is some mechanism where, without cutting off all the appliances, without wearing the galoshes and the overcoat, and so forth, we can slow down the dials. We do it, not by depriving ourselves, or by having to wear the overcoat, but we do it by making a more energy efficient home.

The CHAIRMAN. I think that if you had such a company in my part of the country, in Louisiana, especially in the summer time, the first thing any company would do, before it begins to put in the storm windows, or installing more insulation, be to cut down on appliances?

Most houses down there have a gas range, and the gas range is lit by pilot light. If they went to all those places, and simply substituted some other lighting system for that pilot light, they would save about one-third of all the energy that that gas range would use.

You would think that they would want to do all those things before they would get around to even installing storm windows.

Mr. BARTNOFF. I am sure that as a utility, we are not going to get involved in the operation of the conservation company, but I am sure that in most homes that is going to be one of the first things they look at, the use of those pilot lights.

I am told that in the home where I am up north, in the winter time it does not matter much because it is helping to heat the house, which is going to be heated anyway.

The CHAIRMAN. But in the summer time you have got to turn the air conditioning up to offset the pilot light.

Mr. BARTNOFF. I am told that it helps to keep the cellar dry. I am willing to forgo a little bit of that dryness and save the energy.

Senator BRADLEY. Mr. Chairman, I might say as well that it is in the interest of the energy conservation company to do everything it can to achieve a saving, and the pilot light, as you have correctly pointed out, is one specific area. That is also a reason why the fly-by-night operator might not be able, and cannot, in fact, get into the operation. He has to have enough of his own capital initially to attract private capital to last for 2 or 3 years—in fact, to last 20 years, because his payments are going to be spread over that period of time.

The CHAIRMAN. Let me ask another practical question now. In any area, be it a low-income area, or any other kind of area, if

more people move into the area—for example, because of the economic situation in Puerto Rico, more people move into New York, and they will be using more energy because there are more people demanding it. Do you have an idea as to how to adjust for that, the fact that there are more people living in the same house, or in the same buildings?

Mr. BARTNOFF. I guess we are here to discuss the energy efficiency of the house. You have hit on a problem, Senator, which makes the proposal here especially attractive to a company such as ours, which right now is facing a shortage of capacity. If we can do anything to mitigate that shortage, if we can do anything to mitigate the requirements to add new electric generating facility, that is in our benefit, because right now the cost of any addition is so high compared to the average cost of what we put in the past, that an additional generating unit represents an increase in the average cost.

One of the concerns I have, and I have spoken to Senator Bradley's staff about this to some extent, is that the energy conservation devices are not necessarily devices which will reduce our peak demand. In the electrical utility industry, we must be prepared to supply that peak, because we do not have much in the way of a mechanism for storage of electricity. When the person turns on the air-conditioning, turns on the switches, the energy is converted from uranium, from oil, from coal, from hydro, whatever it is, instantaneously. We feel that the energy conservation will do more to help the average than it will the peak, but there is a portion of this which is devoted not to straightforward conservation as such, but to what we call load management, to spreading that heat, to averaging it out.

Now if I could take a minute or two, I will give you an example. We have in our service territory customers with electric hotwater heaters. The usual electric hotwater heater is a tank with a capacity of about 85 gallons, or 100 gallons, and that is a good size. It uses a heating element of 4 to 5 watts, let us say, 5 kilowatts, and that runs any time the temperature of the water gets too low.

We go in and substitute for that hotwater tank, not a 100 gallon tank, but a 250 gallon tank, a real big one. So we would only need to heat that water at night, and heat up enough during the night to last for the 24 hours. We don't need a bigger heating element, just one off-peak. Then, in the middle of the afternoon that water will not get to a temperature so low that the heating element will go on.

It is only heated at night, and the middle of the afternoon is our peak period, so we have shifted 5 kilowatts of usage from the peak period to an off-peak. It means that it is 5 kilowatts of capacity which in the growth period we do not have to build.

What it will cost us? I will pull some numbers out of the thin air and say that that 250-gallon tank with its installation, and everything else, might cost $500. But putting that in, we have essentially eliminated the need at $500, which is $100 per kilowatt, for new construction for new generation. I have to tell you that we cannot get new construction for new generation at $100 per kilowatt.

Senator BRADLEY. What does it cost?

Mr. BARTNOFF. To build a coal plant, $950 to $1,000 per kilowatt.

Senator BRADLEY. And for nuclear?

Mr. BARTNOFF. Nuclear, $1,100 per kilowatt; oil, probably a little bit less than coal, but who is going to build oil plants nowadays; hydro, you are up in that range of about $1,000. It costs 10 times as much.

Senator BRADLEY. Mr. Bartnoff, I want to get back to the question of how you determine if it is peak savings? Do you think that demand clocks installed in a statistically acceptable number of homes could determine whether the saving was peak or base load?

Mr. BARTNOFF. Senator, I think that with a statistical sampling, we could get a very good idea. One, certainly, on which we can base the rate structure you are talking about, and one that will give us the information we need, just as I understand, from discussions with your staff, that the evaluation of the savings in energy, the preaudit and postaudit would not be done necessarily on a home-by-home basis, but would also be done statistically.

Let's say that you have 1,000 homes of a given type, you perhaps instrument a few percent of these, 10 or 15 of them, and learn that increasing insulation from 4 inches to 6 inches produces a given savings, and based on this you extrapolate in a good valid way to all the homes in that category.

Senator BRADLEY. Therefore, isn't it possible to measure the reduction in residential consumption in the specific area?

Mr. BARTNOFF. I think that if you do some things in the home that involve the load shifting, this is aside from the total conservation, with sample homes enough to give you a statistically valid result—I have not delved in this branch of mathematics in a number of years, although I used to work in it—you could get results that would satisfy any of our rate people in terms of making the proper adjustments.

This would also apply, of course, to possibly the measurements of the conservation itself. It is a difficult problem, maybe, of separating the two, but the statisticians know how to do that.

Senator BRADLEY. There is a statement in your testimony----

Mr. BARTNOFF. Which I never got to give.

Senator BRADLEY. I think if you would like to give it now, you can go ahead and give it. Then we will ask the questions. We have read it.

Mr. BARTNOFF. Senator, I think that I have offered most of it through the questions that you have asked.

Senator BRADLEY. I will, of course, submit to the chairman's desire here.

The CHAIRMAN. I think that he ought to submit his statement, even though we have both read it.

Senator BRADLEY. Let me come to the statement. You say in the statement, at page 2:

> Because the maximum assessment to the utility is limited to the value of the energy savings, no utility customer will ever have to pay more than he or she would have had to pay if the conservation companies had not installed the energy efficiency measures.

Mr. BARTNOFF. This is my understanding of your bill.

Senator BRADLEY. That is correct.

The CHAIRMAN. It is good to get that straight. You are saying that no customer would have to pay any more than he would have paid otherwise.

Mr. Bartnoff: Yes. This, of course, does raise the question, Senator Long, which was raised by the previous witness, Mr. Fischer, where he wondered if the savings from the electricity and gas would be sufficient to pay for the installation of all the energy savings, oil, or whatever form of heat there is. Maybe there are some homes that still heat with coal.

I could only, to this extent, rely on the calculations that have been done by the consultants for Senator Bradley and his staff, who feel that those savings would be there. I am not sure. Though it does not appear in the bill, there has been some discussion as Mr. Fischer pointed out, concerning some requirements for supplemental payment by the recipient of the energy conservation procedures on the home either the owner or the renter, if it is a rented home. That would make sure that enough dollars were collected.

There would always be a requirement for no more dollars than would need to be paid to the energy conservation company and, perhaps, the auditors, and there may be a charge by the utility company if they collect these supplemental payments. But those others are small compared to the base one. If the energy payments to the energy conservation company, based on energy savings, are always a good deal less than the cost of the energy saved, then this is possible.

The CHAIRMAN. It seems to me that you would take the top priority units first. For example, if you take in the State that I have the honor to represent, that is Louisiana, where it is very hot in the summertime, and all houses have pilot lights on all those stoves burning all summer long. So, every time you turn off the pilot lights you not only save that much gas, but you save the air-conditioning it takes to offset the heat that the pilot light puts inside the house. That is a 3-for-1 saving right there, every time you turn off that pilot light.

Mr. BARTNOFF. You have got something there, Senator, and I have got to tell that before I worked for the utility, I worked for a big electrical manufacturer, whose name I will not mention, but whose initials are Westinghouse. [Laughter.]

Mr. Bartnoff. I am sure that if you went to Westinghouse, or GE, or many other fabricators of electrical equipment, they will provide you with a little electrical gadget which will go in to replace that pilot light, and which would utilize energy only when it needs to be turned on.

There is an initial capital investment, and there is a payback period for this, where you would not only save dollars, but you would save energy.

THE CHAIRMAN. The point there is, you go to first things first. If I had the contract to do the job in any city in Louisiana, I think that I would put my boys out first just taking out the pilot lights. Later on, you start getting to these things where you might make money at it, or you might not. But if you take the big cost items first, I don't see how you could fail to make money at it, and that, obviously, I think is a priority saving.

Mr. BARTNOFF. The Senator is here, and it is his plan, but my understanding is that the inherent mechanism that he is proposing, with the setting up of the energy conservation company, which collects dollars not in terms of its expenditures, but in terms of what it saves, that that inherent mechanism, with the way our profit system operates, is going to induce that company to do these things first, to do the obvious, to do those with actual savings, before they get to the others.

Senator BRADLEY. Mr. Bartnoff, I would like to comment on your comment on Mr. Fischer's testimony. Indeed, there exist in the legislation, the possibility of a conserver class chargeback. Let's assume the worst case possible, and assume your normal rate increase, say, from 1972 to 1978. Just a normal rate increase.

Mr. BARTNOFF. The normal rate increase we have had in our company, and this is off the top of my head, is one that very roughly has been one that has kept pace, or almost kept pace, with the normal inflation.

Senator BRADLEY. So it is under 10 percent, except in these days.

Mr. BARTNOFF. From 1972 until now?

Senator BRADLEY. Yes.

Mr. BARTNOFF. No. Are you saying 10 percent, or 10 percent per year?

Senator BRADLEY. Per year.

Mr. BARTNOFF. I think that it has been less than that. I can provide you with those numbers.

From December 1972 to December 1979 the rates for a residential customer using 500 kilowatt-hours per month increased by 9.889 percent compounded annually.

Senator BRADLEY. Let's assume the worst case, where you don't have sufficient savings to cover the cost of installation, and this is nationally—not in one area—but national in scope. Let's assume that you had 100 units of energy that you paid $100 for. The conservation company came into your home, and reduced that consumption in half. You are now paying $50 for 50 units of energy, but because at that moment the national saving is not more than national costs, you have to have an additional assessment to the conserver class, that being those people who have received that reduction.

Let's assume that that increase to the conserver class is not a little below 10 percent—which is what the normal increase is—but let's assume that increase is 40 percent. That means you would be paying $70 for the energy. You are still better off because you were paying $100 for it, and without the conservation, you probably would have to pay $120 for it, because they would have to bring on new capacity, or pay ever increasing oil costs. Is that not correct?

Mr. BARTNOFF. Sure. What this comes down to is, the plan is not one that involves paper savings, but one of real savings in that there is less energy consumed. It is not just a juggling around where maybe somebody saves, or somebody costs.

The actual actual savings, hopefully, as I see the broad picture, is enough to provide a profit to the energy conservation company, an incentive to the utility, and a major incentive to the consumer, and has aside from these incentives, in terms of dollar savings, the real bit potential of cutting down on our energy requirements. To the

extent that this is a cutting down of energy requirements, in general it is good, but to the extent that it is a cutting down on energy requirements such as oil, which is not native to our country, for which we are dependent on outsiders, and on outsiders not necessarily friendly to us, to that extent it is not good, it is excellent.

Senator BRADLEY. Senator Boren, do you have any questions?

Senator BOREN. I would, Senator Bradley.

I want to say that I appreciate your testimony. I certainly think that Senator Bradley has a good idea here. I want to explore certain aspects of it.

Your company, I gather, has a shortage or deficiency of energy. You do not have excess capacity.

Mr. BARTNOFF. We have a deficiency of energy.

Senator BOREN. So you are clearly in a situation where you can make this calculation that, "Well, it is going to cost us significantly more per kilowatt to build the additional capacity than it is to conserve."

Mr. BARTNOFF. My company right now is in the peculiar situation that we can benefit doubly. First, we have insufficient capacity. Second, we are in the position where we don't have the financial ability to build new capacity. Therefore, we could benefit doubly because, in essence, what this plan calls for us to do is to construct negative generation, and it gives us the wherewithall to pay for that.

Senator BOREN. So it clearly makes sense in your situation. But what about the companies, and I am not sure how many of these there are, I have no idea of how many companies already have additional capacity coming on line, and I am certainly not here advocating the value of excess capacity, or say that we ought to devise an energy policy based upon it.

What kind of a problem are we dealing with, do you think, in terms of the proportion of utilities that, perhaps, either have existing capacity now or, if we undertook a significant conservation program, how many companies would have overplanned for the future and would already be financing excess capacity?

Mr. BARTNOFF. I think there are companies that have overcapacity. As you know, to a large extent, the utilities are intertied through grids, through interconnections, so some of that excess is shared. Our company, for example, which is deficient, has not had any problem this past summer in meeting demands of customers.

To answer your point specifically, I think that one of the beauties of the Bradley approach is its connection with the refundable tax credit, where the utility which has that excess need not necessarily go to the point where it has got to increase the rates in order to make up for capacity, where it is there, but it is not needed.

Now, as a taxpayer, in the short run I guess I would be a little unhappy with this, but in the long run——

Senator BRADLEY. But aren't you unhappy with all taxes, Mr. Bartnoff?

Mr. BARTNOFF. Not necessarily.

Senator BRADLEY. I am.

Mr. BARTNOFF. No, Senator, I have always looked forward to the day when my income tax obligations would increase, and increase,

and increase, because I know what the reason for that would be. So that is not a tax with which I am unhappy.

But I recognize that this is a temporary thing because, in general, all the utilities, whether they have an excess or a deficiency now, sometime in the next 5, 10, not 20, not that long, but within the next few countable years, are going to be faced with the requirement of adding capacity.

Senator BOREN. You don't see this as a serious problem. You do think that it can work, the tax credit method?

Mr. BARTNOFF. I think so.

Senator BOREN. Let's suppose you had excess capacity for a minute, how hard would it be for you to calculate the amount of revenue loss you would experience through the conservation? Would this be a fairly easy calculation to make?

Mr. BARTNOFF. I think that it would be more difficult than the other calculations Senator Bradley asked me about, where you put meters in houses, and so forth. It is a very complicated one, because let's say that we had the excess, and that excess is not used, you have to sit back and ask yourself, "If we did not have this Bradley plan in effect, how much of this would not have been usable anyway?"

I don't think that I can give you a simple answer, but in the utility industry, in our interchange agreements, and so forth, to make an analysis of this type, what it involves is, beforehand, the setting up of some kind of a formula which will attempt to take into account these various factors, needs of your neighbors, what you might have sold, and so forth, and do it so that both the taxing authorities and the utilities are satisfied that this will work, and then always, post facto, you can make an analysis of what actually happened and adjust where it is necessary.

Senator BRADLEY. May I comment on that, Senator Boren?

Are you saying that the savings and, therefore, the reduced revenues that accrue from the conservation, which could be resold either within your own area, possibly, or did you mean to imply that you would sell it to another utility area as another possibility?

Mr. BARTNOFF. That would depend on the circumstances. In our case, for example——

Senator BOREN. You are buying from some other company their excess capacity.

Mr. BARTNOFF. If we are buying, the company is selling. They have excess. If the reduction in demand through a Bradley plan would reach a point where we don't have to buy, the company that has the excess might have to eat that. On the other hand, who is going to say whether they could not have found another customer, or whether their own growth might have taken care of it, and so on.

So it is complicated, but that is part of the challenge.

Senator BOREN. I am sorry I just got in at the end of your comment about peaking versus base in terms of calculating the savings. How difficult is that to determine?

Mr. BARTNOFF. I am sorry, I did not understand.

Senator BOREN. Let's say, when you are talking about total energy savings in terms of not having to build the capacity, as I understand it, your saving at the peak is much more important

because you are not having to build that capacity, and the peaks that you calculate for are much lower. How difficult is that to figure?

In other words, can you assume that if my utility bill, because I had the house doctor come by, and he says: "We can profitably spend $1,500," and my own utility bill goes down 50 percent, I assume that all of that 50 percent that I saved on my utility bill would not be chargeable against the reduced peak demand period.

Mr. BARTNOFF. Let us look at the peak, say, in our service area, where we are a summer peaking company. We peak when all the air-conditioners are on. Now my people tell me that in the absence of any other adjustments, putting in more efficient air-conditioners would not reduce that peak, and even improving the insulation would not improve much because on that really hot day in summer that air-conditioner does not cycle, it just goes 24 hours. It goes all through the day, through the peak period, and the temperature in the room is not necesasrily governed by the thermostat, it is governed by the ability of that air conditioner to remove heat, or to pump in cold, whichever way you want to look at it.

Now if you put in a more efficient air-conditioner, unless you put one in that is so efficient that it does the cooling that brings it to where the thermostat, rather than the ability of the machine, sets the cycling, you are going to lower the temperature of that room more than it otherwise would have been, and you might even increase the peak.

But there is a lot that can be done to shift peak usage. We could have cold storage. Many industrial builders are now putting in cold storage, so that the air-conditioner can work at night offpeak, store the cold either in ice or in cold water, and then utilize it during the peak period during the day.

Senator BOREN. That would be a saving. Let's suppose I put new insulation in my house. You are saying that maybe it will save me the year around, and it will save me in the cold period maybe more than in the hot weather.

Mr. BARTNOFF. You have two areas here. One is on the peak, and one is on energy usage. The insulation will save on the energy usage.

Senator BOREN. It will not necessarily save on peak.

Mr. BARTNOFF. Not necessarily, but it would help.

Senator BOREN. But you have to build capacity on peak.

Mr. BARTNOFF. We have to build capacity on peak. Therefore, we are glad to see that there are words in the Senator's bill which say, not only energy conservation, but also energy usage—I forget the exact words, but it is in there as well, and that is important.

Senator BOREN. You have to build a formula based on that. What I am worried about is for the dollars that you pay the insulating people work out to save capacity because of the peaking problem.

Mr. BARTNOFF. It would have to be worked out on that as opposed to, say, putting in the device that I mentioned that shifts the peak. Shifting the peak also involves some energy conservation, because if we can shift the peak to an offpeak period, we are able to utilize what we call our base loads line, those that are running all the time. These can be double the efficiency of the so-called

peaking units, the old units, the cats and dogs which go on only when we need that last bit of energy.

Senator BOREN. So you still save significantly, but not having to build additional base capacity, if we could call it that, in addition to it.

Mr. BARTNOFF. We save by actually improving the efficiency of usage.

Senator BOREN. My overgeneralization that the size of your capacity is determined only by peak is not exactly right in the case of all utilities because of the different kinds of facilities.

Mr. BARTNOFF. I think your statement is right. I think that the answer to that is, do something about the peak, and this plan does do something about the peak

Senator BOREN. Thank you very much.

Senator BRADLEY. Let me just again point out that the incentive is for the energy conservation company to address this peak problem as well as the base load.

Mr. Bartnoff, I thank you for your testimony.

Mr. BARTNOFF. I did not make my formal statement, Senator Bradley, and I want to tell you that one of the things, and I said this before, when Senator Ribicoff was questioning me, as a utility, one of the things we look on here as different from other plans, and one of the big advantages from our utility point of view is that this does not put into the energy audit business, it does not put us in the insulation and installation business, it does not put us in the banking business. We think that this is good.

Senator BRADLEY. What does it cost the utility to perform an audit under the Public Utility Policy Act; what would you say, roughly?

Mr. BARTNOFF. I don't know.

Senator BRADLEY. Would you say that the number $95 is reasonable?

Mr. BARTNOFF. I think probably in the order of $60 to $100.

I have to say something else, though. When we go and we perform an audit, under the present conditions we do not have the incentive for performing that audit that your energy conservation company has. They have a profit motive there to look for those things that are going to give them the maximum return on energy conservation procedures.

Our guys go in, and they are competent, I don't want to say that they are not, but they don't have that same profit motive. Their profit motive, in some ways, and I don't like to think that we don't do a good job, is to do that audit that is required of us as cheaply as possible.

Our fellows do a good job, but you can see what the difference would be when the incentive is different.

Senator BRADLEY. I certainly can, and my only point is to tell you that if the residential energy efficiency plan were adopted, you would not only not have to do the audits, but you would not have to pay the $60 to $80 that you are required to pay under the law to do the audits of the over 600,000 homes in your area. So if you calculate that, it is a savings for utilities as well.

Let me ask a quick question. I know that we want to get on to Mr. Holmbraker, but one quick question, and that is—from the

utility standpoint, how does this conservation approach compare to the idea of grants, or loans? I understand how you feel about the utility as a banker, but could you just answer that question?

Mr. BARTNOFF. I can't speak for all utilities. I can only speak for my own company, and the general public utilities of which our company is a subsidiary. I think this, I think there is some advantage to having consumer participation in the cost. Perhaps this is only psychological, but somebody who gets something for nothing often evaluates it based upon what he pays for it.

Senator BRADLEY. But he will not be getting it for nothing, will he?

Mr. BARTNOFF. It might seem to him that way, and a little bit of an extra charge on the utility bill might help your bill.

In terms of your question on loans, ultimately there is only one person who is going to pay for it, and that is the consumer, whether it is the individual consumer, or whether it is the consumer as a whole sharing the burden. That is one of the things that has got to be worked out.

What happens to the fellow who put in insulation at his own expense 2 years ago, and now his neighbor with the same house is going to have it done with no outlay of dollars to him, and both of them are going to be assessed in their utilities.

These are things which I think you and your staff, Senator, not only have got to look at, but I know from conversations with them that they are looking at them.

I think that in terms of national interest, where it is in our national interest to get a conservation program going, this is one that is going to be easier to implement. Our experience with those that require the initiative on the part of the consumer, up to date those programs have been disappointing.

I was here when you posed a similar question earlier today to Mr. Fischer, and I can only tell you that you are asking a question like motherhood, and so forth. How can I answer differently than to say that this would be more attractive to the consumer.

Senator BRADLEY. Thank you.

Mr. BARTNOFF. I think that this is best for all of us.

Senator BRADLEY. Thank you very much, Mr. Bartnoff, for your testimony. I would have more questions if time permitted, but we do have several other witnesses. I appreciate your testimony. I think that it has been enlightening. Thank you so much.

[The prepared statement of Mr. Bartnoff follows:]

STATEMENT OF SHEPARD BARTNOFF, PRESIDENT, JERSEY CENTRAL POWER & LIGHT CO.

Mr. Chairman, my name is Shepard Bartnoff. I am President of Jersey Central Power and Light Company, which is a subsidiary of General Public Utilities and which provides electricity to almost half the area of New Jersey. I am here today to present my views, and the views of the officers of my company and of General Public Utilities, on Senator Bradley's Residential Energy Efficiency Plan.

Let me start by saying that Jersey Central strongly supports Senator Bradley's approach to residential energy conservation. As I understand the Bradley Plan, it provides for private energy conservation companies, under contract with a local government agency, to retrofit homes and apartments in areas designated by the Secretary of Energy. The contract will specify the price per unit of saved energy that will be paid to the energy conservation company.

The energy conservation company, using private financing, will organize and manage the retrofit program. It will sub-contract with local suppliers and installers

and retrofit experts to perform systematic, block-by-block energy audits and to install the recommended energy conservation measures and load management techniques.

The audits and installation will be offered with the consent of the owners, free of charge, to both home owners and renters.

The contracting government agency will also arrange for independent preretrofit and postretrofit audits to determine how much energy the conservation company has actually saved. Once the savings are measured, the energy conservation company will start to receive payments which will continue over the life of the twenty-year contract. By tying payments to performance and savings over the twenty-year duration of the contract, the Plan introduces a profit motive, screens out fly-by-night firms, and ensures both lasting quality control and maximum energy savings.

The energy conservation companies are not paid by the homeowners or residents, but are paid out of a revolving fund administered by the Federal Government. This fund will be underwritten by Government bonds which will be retired by assessments on utility companies. The utilities will be permitted to pass these assessments through to their customers. However, the amount a utility will be assessed in any year will not exceed the amount it would otherwise have spent on fuel purchase or on constructing new capacity for the energy conserved. Because the maximum assessment is limited to the value of the energy savings, no utility customer will ever have to pay more than he or she would have paid had the conservation companies not installed the energy efficiency measures. And in most cases, consumers will experience an immediate reduction in energy consumption so over-all energy bills, mostly for heating and air conditioning, will go down.

In some cases, however, a utility that has excess capacity may experience a revenue loss as a result of the conservation. This could occur because the utility might not be able to offset reduced residential demand with savings on fuel purchases or by finding new residential or commercial customers.

However, under the Senator's Plan, the utility would be able to offset the revenue loss caused by conservation with a refundable tax credit, thereby avoiding having to raise rates.

In sum, we regard the residential energy efficiency plan as a unique opportunity to harness saved energy, displace the expensive electricity we must currently purchase from the grid, and to help overcome the major financial impediments to installing new generating capacity.

Moreover, in our opinion the Bradley Plan is the only residential conservation proposal that gives utilities an opportunity to anticipate and plan for the impact of conservation on energy supply and demand. By making it possible for utilities to plan for energy savings, the Bradley Plan enables us actively to promote conservation without having to worry about creating excess capacity and the rate increases this entails.

We also support the Bradley approach because, unlike so many other existing or proposed conservation plans, it does not require utilities to be either bankers or insulation installers.

Finally, we think the refundable tax credit the Senator has proposed is attractive because it provides us with additional insurance against having to raise rates to offset net reductions in demand due to residential conservation.

Senator BRADLEY. Our next witness is Mr. Bernard Holmbraker, director of finance, Federal Leasing, Inc.

Mr. Holmbraker, welcome to the committee. I know that we are anxious to hear your testimony, and I would suggest that you begin. As I understand it, your area of interest is the energy conservation company itself, and what thought might be given to that, and your impression.

STATEMENT OF BERNARD HOLMBRAKER, DIRECTOR OF FINANCE, FEDERAL LEASING, INC.

Mr. HOLMBRAKER. Thank you, Senator, members of the committee.

I think given the time that has passed, I will be quite brief. Perhaps I could paraphrase my statement.

Senator BRADLEY. Feel free to reiterate the points.

Mr. HOLMBRAKER. I appear primarily as a businessman with a background in finance. I am currently director of finance for a company called Federal Leasing, which is a company that finances equipment purchased by the Federal, State, and local governments to the tune of $60 million a year.

For the past 4 years, I have participated actively on a part-time basis to bring into creation several alternative energy companies, having been the founder of a small investment banking company dedicated almost solely to energy company development financing. I am currently the chairman of a solar company.

At first glance, it may seem odd that a small businessman should appear before you to extol the virtues of granting a tax credit to a public utility, since one would assume that they are well able to speak for themselves. Let me say outfront my reason for supporting this proposed tax credit is selfish.

If the utilities do not suffer as a result of the Bradley plan, it will work better than if they do suffer. I think that it is just about that simple.

Senator BRADLEY. You said, if they do not suffer?

Mr. HOLMBRAKER. If they don't have to suffer by virtue of not being able to meet the various expenses entailed. Therefore, when I look at the tax credit, I look at it as at least holding them in a neutral position.

It is my feeling that the energy conservation company element of the plan, and in a sense I represent all those companies that are not even formed yet, and certainly cannot be here yet to present their own solutions. I think the financial objectives, and their financial livelihoods will be able to be served by the financial community, since it will be profitable. It is fairly apparent that given the proper structure, and everything, that profit will be forthcoming.

In the conversations that I have held to date with the institutional houses, I have seen a certain amount of eagerness as there has been a certain awakening to the gravity of the energy situation, and the financial objectives that can be obtained therein.

It is the other end of the plan, the utilities' role, that concerns me as much, if not more. I think in this instance, the strength and the reassurance of the Government backing in order to keep from penalizing the utility for good corporate citizens is necessary. To penalize the utility by cutting off its revenues, which are its rewards, we are discouraging efforts to conserve, as net loss to the utility can happen, as was said before, when the conservation activity produces a declining revenue to the utility.

The problem with that is, faced with the unforeseeable consequences of the cooperation in the Nation's conservation movement, the utility could be expected to be cautious. That caution, I think, would ultimately lead to resistance. I don't think that we, as a nation, want to particularly want to remain in bondage to the oil rich nations until something unknown or undesirable happens. Therefore, I don't think that this hiatus, if you will, while the utilities stop and see the possibility that they are damaged, or the extent to which they may be damaged in their financing should come about. I think that the solution lies within the scope of your plan.

The examples of just how this penalty comes about have been given today by Mr. Bartnoff, and I do not need to elaborate.

The commercial world does have a stake in the full fleshing out of the equation. The utility has a prime role in that. If the homeowner, the utility, and the governmental contracting agency are at least held free from harm in this program, and the energy conservation companies will have an arena in which there is sufficient activity and opportunity for profit, to have unregulated market risk/reward ratios produce the rest of the driving force necessary to make such a program work.

I don't feel that it is necessary to elaborate after that, Senator. It is just that simple.

Senator BRADLEY. Mr. Holmbraker, I think that we will submit your entire statement to the record.

What I am particularly interested in is your assessment, as someone with a background in finance and business, as to whether you think that an energy conservation company could, indeed, obtain front-end financing for the installation of this equipment, while it is waiting for the measurement in energy savings, over a 1- or 2-year period?

Mr. HOLMBRAKER. I think the answer to that is clearly, yes. What it depends upon, I think, are the number of unknowns. That is why I say that all the numbers of the equation must be fairly definitive.

What Wall Street and the other financial houses of the world fear are unknowns. Therefore, if the plan is well laid out, is well articulated in the sense of the mechanism that is presently proposed, it would seem to be quite clear that the risks are clearly few. There are risks, and that is my job, and the job of others like me who will come after. But it seems to me to be clear cut enough. It seems to me that the shot that you are taking is one that is fairly taken.

There are some real advantages now in the cohesiveness that will come about. At the moment, when you look at conservation companies, all you have to do is ask yourself how you would go about getting conservation put in today. There is no scientific background. There is very little known about the whole area. So it is all ad hoc.

If the Government, your committee, and various members of such, can produce a clear-cut system with predictable consequences, I would think that would provide more than enough motivation.

Senator BRADLEY. So if you went to Wall Street with a contract that said that you would be paid 10 mills for every kilowatt of electricity you save, and you looked at an area and you projected you could save 10,000, you feel that that contract with the Government is a pretty good backup for your financing, plus your own managerial skills.

What kind of representations would you be required to make to the financial community that you could get the job done?

Mr. HOLMBRAKER. I think that they would look at two things. We have talked about five pilot programs in the Nation, and I think that the outcome of those would be the first thing that they would

look at. It is clear that they would have to see the profitability produced by those.

I think that they would look for the normal things in the managerial area. They would look for experience. They would look for capitalization. They would look for commitment. They would look for size, breadth, and scope.

I really don't see anything abnormal about it, Senator.

Senator BRADLEY. So that we have here three places where there are checks on a conservation company that insure only skilled and reputable people get into the business, and they are first where the contracting agency negotiates the rates; second, where the Secretary of Energy has to approve that rate; and third, where the conservation company has to go to the private capital market.

What we have here is the investment banking sector of our economy that is, in part, assessing the viability of the companies.

Mr. HOLMBRAKER. I think that this is one of the many keys to the whole plan, as I have heard people try to analogize the HUD programs and the like. It seems to me that this is an entirely different creature because of that element.

Senator BRADLEY. Just one last question from my standpoint. Do you see any problem with the anticompetitive aspect in the plan? Mr. Fischer mentioned this.

Mr. HOLMBRAKER. As a matter of fact, I think that it would be highly competitive. I think if the plan came about, there would be some real competition. One of the provisions of the plan is that the work in each geographic entity be passed out to local suppliers and installers. I think it would, in fact, encourage competition, which at the moment may well go toward the major nationwide company. I think that if it is divided up into regional segments, there would be a lot of regional competition.

Senator BRADLEY. The energy conservation company is really a management company. In the bill we specifically provide for the use of local suppliers and installers.

Mr. HOLMBRAKER. There is nothing that stops it from being 15 management companies in 15 different parts of the country.

Senator BRADLEY. Or 5,000.

Mr. HOLMBRAKER. That is right.

Senator BRADLEY. Thank you.

Do you have any questions, Senator Wallop?

Senator WALLOP. I have one.

Take Senator Bradley's figure of saving 10,000 kilowatts. How much capital do you estimate it would take—I realize that it requires you to pull a figure out of the air—to get you into the business?

Mr. HOLMBRAKER. I cannot address it in terms of kilowatts.

Senator WALLOP. In terms of what should I phrase the question?

Mr. HOLMBRAKER. At the moment, it is in terms of the amount that it costs per house, and the size of the geographic territory that you undertake.

Senator WALLOP. But the problem that I am trying to find some solution to is that you said there could be fully funded financing, and the answer is not necessarily, yes. What troubles me, and I like this idea, so I am not talking against the proposal, but it might well be a considerable time before you start getting a return on

investment, so you would have to be able to forecast how much capital you were going to require.

If you were to be one of the pilot projects, if that is the way it goes, or if it were just to be launched out as a program, and you were to participate in it, how much capital do you suppose it would take you to enter into the energy conservation company business, and to sustain yourself for a business cycle? I think that this is where it is going to become difficult for many people to enter the program.

Mr. HOLMBRAKER. The question is almost impossible to answer, because I don't know the scope of the initial undertaking, the scope of the geographical territory. I would say, $100,000.

Senator WALLOP. To sustain the business for 3 years while the measurements were being made?

Mr. HOLMBRAKER. That is to sustain all the operating costs, and the logistics, if you will.

Senator WALLOP. Would that be annually, or would that be for the entire period?

Senator BRADLEY. Let me interrupt. I think the more correct statement is the one where he said that it is impossible to tell what the costs will be. Let me give you an example.

In one region of the country where they have done some conservation, and where they have attempted to demonstrate the cost per unit of energy saved, they have been able to save over a 20-year period a kilowatt hour of electricity for 2.3 cents. That is spread over a 20-year period.

Assuming as a round figure that a normal retrofit, a really good one, costs about $1,500 per house, and assuming you are going into an area where there are 1 million houses, you clearly need to raise the equivalent of $1.5 billion. But this is over a long period of time.

Senator WALLOP. For someone who has wandered in the capital market a little bit, sometimes successfully and sometimes otherwise, it occurs to me that the most difficult part of all of this is just in this area, where you are going to have to persuade somebody of the capability of your company, and the capability of saving that, and then sustain that, in light of a skeptical lender, for a couple of years, until your savings are proven.

Mr. HOLMBRAKER. Therefore, you had better choose the members of your team wisely.

Senator WALLOP. Somehow or other I find this a little bit hard to believe that you will get it in any large way early, because of a bad complication, you are going to have to sell a lot of people on a new idea.

Mr. HOLMBRAKER. There are 300 solar companies in the United States at the moment, which have undergone the same thing, and who a couple of years ago did not exist.

Senator WALLOP. Yes, but your potential return is virtually immediate as you start selling the product. The risk is there, but as soon as you start selling the product, you have an account.

I understand this, you are going to have to demonstrate your performance after a period of time. That is what I am talking about, it is the time frame that some capital investor is going to have to sustain you for.

Mr. HOLMBRAKER. Your return starts at the end of the first year, when you have demonstrated savings, and it comes in over ensuing years thereafter. So the return starts at the end of the first year.

Senator BRADLEY. I think that this is an important point because although you might need $1.5 billion to do the job, you don't need it all up front in the first year, because you are going to gradually phase in. After the first and second year, you begin to get a revenue stream from the Government.

Mr. HOLMBRAKER. Then the contracting agency begins to pay you back.

Senator WALLOP. I understand that. I have no problem once the business cycle is well underway, but it is the establishment of the program that troubles me. If I were an investor interested in pursuing this with you, I would be more comfortable with your solar company than I would be your energy conservation company.

Mr. HOLMBRAKER. As the chairman of a solar company, I think I can tell you that I would be 50 times more comfortable with this plan than the solar company.

Senator WALLOP. Yes, but you could demonstrate something to me as an investor in a solar company, couldn't you. You could bring in a functional unit.

Mr. HOLMBRAKER. If I may, sir, may I refer to the five pilot programs that were conducted throughout America under different conditions, the purpose of which was to demonstrate just that fact. That is why if we go into this wholeheartedly in a full scale, one would have to conduct these five programs, they would have to be five active programs, and the financial world would have to take heart from those.

Senator WALLOP. That is basically where I thought we might end up, that it probably would have to be demonstrated.

Mr. HOLMBRAKER. Yes. If it was not, then I don't think that one could raise 10 cents.

Senator WALLOP. Thank you very much.

Senator BRADLEY. Thank you very much.

[The prepared statement of Mr. Holmbraker follows:]

TESTIMONY OF BERNARD W. HOLMBRAKER

Mr. Chairman, Members of the Committee, my name is Bernard Holmbraker and I reside at Box 101 in Waterford, Virginia.

I appreciate the opportunity to appear the before you and testify on the importance of the Public Utility Energy Conservation Tax Credit. I appear primarily as a businessman with a background in finance. I am presently the Director of Finance for a company called Federal Leasing, Inc. which is a leasing company engaged in the financing of leases for equipment, entered into by Federal, State, and local governments. Federal Leasing is a nationwide company which finances approximately $60 million worth of equipment per year.

On October 1, 1979 I will be resigning from Federal Leasing to devote full-time to the development and financing of fledgling alternative energy companies. For the last four years or so I have participated actively on a part-time basis in the gestation and birth of several alternative energy companies—having been one of the founders of a small investment banking company dedicated almost solely to energy company development and financing. I have served on the board of a solar company and am presently the chairman of the board of another small solar company. For the last serveral months I have devoted increasing amounts of time to the creation of an energy conservation company because of a clear and present opportunity in the market place to meet a national need.

At first glance it may seem odd that a small businessman should appear before you to extoll the virtues of granting a tax credit to a public utility since one would

assume that they are well able to speak for themselves. My reasons for supporting this proposed tax credit are selfish. If utilities do not suffer as a result of the Bradley Plan it will work better than if they do suffer—even though that suffering may be more than defensible from a public policy standpoint.

It is my feeling that the energy conservation company element of the plan (call it the consumer end of the plan) is readily financeable by normal market financing means. It is true that the financing will have to be a bit more creative and farseeing than financing of a normal transaction but that is handleable and, depending on the signals coming forth from the Federal government, may even be easy.

The other "end" of the plan—the utilities role, where electrical, oil and gas energy is being conserved, more clearly can use the strength and reassurance of governmental backing in order to keep from penalizing the utility for being a good corporate citizen by cutting its revenue as its reward for encouraging efforts to conserve energy in the home.

This "net loss of revenue" to a utility can happen when broad and effective residential conservation activities in a geographical area temporarily produce a declining revenue to a utility. The revenue loss would occur wherever the loss in revenues was not matched by savings in the utility's fuel costs or by finding new residential or business users equal to the segment of the revenue that disappeared. While almost all would agree that the consequent reduced consumption of fuel by the utility produces a clear national benefit, it must also be granted that the loss of revenue by the utility would be a phenomenon that probably couldn't be handled very well in the short run by our existing institutions.

Faced with the unforeseeable consequences of its cooperation in the nation's conservation movement, a utility can hardly be blamed for caution. The progeny of caution is resistance and the consequences of resistance are simply that conservation is desirable—but not acted upon—and we as a nation remain in bondage to oil rich nations until something unknown or undesirable happens.

A solution that is within the control of those to whom the people look in this emergency is to provide a refundable tax credit to offset utility revenue losses which are caused by consumer conservation action.

The scope of this "backstop" can't be determined with the information that I have at hand. One must assume that it is determinable by one of the governmental agencies involved in this area. A "cap" is put on the governmental involvement by stipulations that the amount credited to a utility could only be as great as the rate increase that would have been necessary to offset the loss of revenue.

It is reasonable to expect that the plan would work as follows:

Assume that a utility has 10 customers who pay $10 per year for electricity. All of the customers become the beneficiaries of the Bradley Plan's Residential Efficiency Program. Assume, also, that their bills drop by 50 percent (and this is not necessarily a hypothetical assumption). The utility's revenue drops from $100 to $50.

But offsetting this loss is the fact that the utility spent $40 less for fuel not used. The conservation plan has cost the utility $10. On the plus side of the ledger is the fact that in the year in question it was able to find additional users in the amount of $5. The net cost to the utility is $5. Undoubtedly, to maintain its financial attractiveness the utility is faced with the prospect of raising its rates to recover the $5.

If this happens then the consumer will continue to regard utilities as villains, and, in a sense, little will have changed in the public's perception of what has happened. The drama will be gone. Nobody is the "winner" except the national good--since less oil is used.

Now, I don't want to argue that the national good is irrelevant—but I do want to observe that it alone is too abstract a benefit to make the engine go here. The energy dependency problem is great enough to require dramatic, intensive responses and the benefits—free energy-efficient residences throughout the nation—would appear to justify governmental refundable tax credits as a key to successful implementation. In the case at hand the $5 would be received by the utility as a credit.

Eventually the utility will be faced with the need to create and build additional capacity. Here the forces of inflation come into play and produce a highly favorable balance in that for every day that expensive buildings, labor, machinery, etc. are deferred because of the ability to exist with the present energy generating capability, the utility and the nation prosper to the extent that the utility's money need not be spent and the utility consumer need not be charged at the higher rate necessary to cover the high cost of the "new" electricity.

The corollary to all that is also rather simple. If the homeowner, the utility and the governmental contracting agency are at least held free from harm in this program, then the energy conservation companies will have an arena in which

there is sufficient activity and opportunity for profit to have unregulated market risk/reward ratios produce the rest of the driving force necessary to make such a program work.

There is interest in the energy investment community to form energy conservation companies. I am working with a number of people right now to create such a company if the Bradley Plan is authorized. The tax credit for utilities will encourage a cooperative environment for such companies to compete and flourish. I hope the Committee acts favorably on the Bradley proposal for a refundable tax credit. I hope the Congress swiftly enacts the entire Bradley Plan so that the free market can respond to bring this nation a valuable source of immediately available domestic energy.

Senator BRADLEY. Our next witness is Mr. Evan Wilner, Public Advocate of the State of Delaware.

STATEMENT OF EVAN WILNER, PUBLIC ADVOCATE, STATE OF DELAWARE

Mr. WILNER. Thank you for the opportunity to appear today at this critical time in your deliberations on our Nation's energy tax policy, a time when energy matters are of major importance to every American.

As the statutory representative of all Delawareans concerning regulated energy matters, I am involved on a full-time basis with the problems facing individual consumers as they attempt to pay their utility bills. In the larger regulatory framework, I represent both residential customers and giant corporations, whose names are household words, as prices are set for electricity, natural gas, and telephone service.

My daily contacts with individual customers reinforce my judgment that the Bradley proposal addresses one of the most pressing and intractable energy problems facing citizens: How to determine what home conservation measures will be economically beneficial and how to pay for those improvements.

Conversely, my involvement in electric energy rate-making proceedings as required under the Public Utility Regulatory Policies Act of 1978 suggests strongly that the ultimate financing method advocated in the Bradley proposal would negatively impact the utility regulatory process, significantly retarding the present trend to more equitable pricing of electric energy.

We should persevere in our search for ways to improve residential energy efficiency, with the knowledge that frequently those least able to pay suffer the most from inadequate energy conservation improvements to their dwellings. As we continue to make progress in this search, we should not adopt seemingly easy fixes which have significant negative impacts on other aspects of our national energy regulatory activities.

At the time these remarks were prepared, I didn't have access to the Bradley proposal, and I relied on press reports and conversations with the staff members. My remarks are intended to be generally descriptive, and I would welcome any correction of any error resulting from those earlier reports of the proposal.

I am going to skip, because it has been dealt with in various forms, the sequence which is proposed in this measure, which apparently is still under development according to the comments earlier this afternoon.

Let me merely summarize by saying that the justification suggested for the ultimate recovery of conservation investments

through the utility mechanism is the asserted avoidance of massive, new generating plant investments. Transfer of these costs to all utility ratepayers is assertedly more than offset by savings going to all utility customers from reduced capital investment.

You have heard about that this afternoon, and I must say that it has been expressed in a very peculiar way.

The regulatory aspects of the Bradley proposal are logically elegant and symmetrical. However, in my judgment, close analysis of the regulatory process and home energy usage provides limited support for either the logical linkage, which underlies this proposal, or the actual relationships which have been asserted.

Simple familiarity with the diversity of home energy sources demolishes the notion of easy one-to-one relationships. Electricity and natural gas are typically regulated commodities. Fuel oil and propane are not. Again, natural gas is overwhelmingly used in the home for space heating, and electricity is not.

The nature of our housing inventory and its present energy efficiency is similarly heterogeneous—old and new home furnaces, good and bad weatherization, little correlation between income level and home expenditure for regulated natural gas, at least. State by State there are great differences in the amount of industrial energy use compared to residential consumption.

How is a single financing measure—or even a hybrid system—ever going to combine this diversity into a single calculable balance of costs and offsetting revenues?

Do presently insulated homes receive some form of credit against the differential assessment for added insulation of the noninsulated?

Do large electricity users pay a large share of the differential assessment—while those using a nonregulated fuel, or even natural gas, escape assessment while enjoying the benefits of a newly energy-efficient dwelling?

Will the proposed excess profits tax on oil production be fine tuned nationally to recover insulation costs from users of fuel oil, while the local utility regulatory process will impact upon electricity and natural gas customers directly?

The simplistic notion that improved home conservation will defer additional utility electric plant construction and thereby in and of itself lower electric costs is questionable on a number of grounds.

In many Eastern States there is presently ample generating capacity to meet winter electric demand, even taking into account the actual situation faced by a witness this afternoon who has several nuclear plants which are not presently capable of rendering the service in the power pool center, which you and I both represent.

New electric demand frequently originates from new home construction. Ample economic incentives should be present today to stimulate a high level of initial conservation in such dwellings.

The most recent U.S. Department of Energy regulatory participation suggests that new non-oil-fired generators are economically beneficial as one-for-one replacements for existing oil fired electric generators, even if the additional units are not required to meet new peak demands. I emphasize that, a direct one-to-one replacement for existing adequate generators fired by oil can be economi-

cally justified merely by substituting another fuel type. Or, to put it in the most practical way that I know how, if oil continues to increase at some continuing exorbitant rate, it will be cheaper to construct new, non-oil-fired generators, and pay the capital costs for those generators, and pay the operating costs of those generators, rather than merely dripping more oil into the fine, nondepreciated oil units you now have.

Necessarily, then, the oil units you now have in much of the Northeast would be overabundant reserve capacity for any purpose at any time. On many summer peaking electric systems, the winter electric load, which is the major topic of discussion with the exception of Senator Long's discussion, is beneficial in providing optimum year-round use of generators.

I emphasize some rather extraordinary suggestions as to how electric systems work, which have been heard this afternoon.

The residential energy conservation potential has been assessed earlier this afternoon in some detail. This committee has begun the process of formulating effective national policies to maximize conservation through selective tax credits, but much more needs to be done.

I will not impose upon your time to outline recent national initiatives in this area. You have heard about them from Mr. Fischer in detail. Suffice it to say there are elements spurring conservation in the Public Utility Regulatory Policies Act, which I try cases under, referred to as PURPA, and the Federal weatherization program, and the like. These efforts are not enough to get the job done.

The Bradley proposal properly recognizes that scientific knowledge must be joined with economic evaluation and practical action to achieve satisfactory results. It is founded upon a recognition that additional fundings mechanisms must be utilized to reach all segments of our society with the improvements.

My own judgment is that we can greatly improve the initial energy audit process now being put in place to furnish economically justified recommendations to each homeowner. I would be happy to elaborate on how this could be done.

Especially with regard to the use of natural gas and electricity, the existing billing data collected by public utilities can be easily adapted to give customers a month-by-month reading of home energy efficiency, right on the utility bill.

Perhaps naively, I would hope we can target the low-income homeowner, the renter, and rental property owners who are not now able to achieve or perceive the benefits of added home energy conservation.

I wholeheartedly believe that needed improvements in the regulatory process can and should be made to reshape energy regulation in the interests of maximum consumer information, choice and energy efficiency.

I welcome any questions you may have.

Senator BRADLEY. Thank you very much, Mr. Wilner, for your testimony.

I have just a few questions. Have you read the bill?

Mr. WILNER. I have read a typed version of it, Senator, which was furnished to me.

Senator BRADLEY. You say in your statement that you did not have access to the bill.

Mr. WILNER. Yes, sir.

Senator BRADLEY. When did you read the bill?

Mr. WILNER. This morning.

Senator BRADLEY. Could you tell me, have you spoken with any staff members concerning the bill in order to understand it more fully?

Mr. WILNER. Yes, sir.

Senator BRADLEY. Who did you speak to?

Mr. WILNER. I contacted members of the Energy Committee, which you serve on, and where I understand this legislation is being analyzed,

Senator BRADLEY. On which subcommittee?

Mr. WILNER. The Subcommittee on Energy Conservation.

Senator BRADLEY. Could you tell me please why you think it is a simplistic notion—I think that was your word—that conservation will defer additional plant construction?

Mr. WILNER. Because I have run the economic analysis, Senator, which demonstrates we have ample capacity in many States to meet any projected load, and that no new construction is necessitated for that reason.

In addition, as I pointed out, the latest work by the U.S. Department of Energy in a northeastern State indicates that the converse of that suggestion is likely to occur if we are not successful in restraining continual increase of oil. That is, the new generating plants are the most attractive method of reducing energy costs for citizens. I represent the citizens of one State, and that is my interest, Senator.

Senator BRADLEY. Do you deny that it can save fuel?

Mr. WILNER. Do I deny that energy conservation would save fuel?

Senator BRADLEY. Yes.

Mr. WILNER. No, sir.

Senator BRADLEY. Are you familiar with load management techniques?

Mr. WILNER. I hope so, Senator.

Senator BRADLEY. You say that you want to target conservation to renters.

Mr. WILNER. Yes, sir.

Senator BRADLEY. Under what existing program will you get conservation into rental properties.

Mr. WILNER. It is my understanding that the administration of the weatherization program in the State of Delaware has made it possible to provide some better weatherization assistance in rental dwelling units. However, that is a very, very insignificant contribution to the extraordinary problem that we face.

Senator, I could not be more sympathetic with the objectives of your legislation. I face every day, as I represent individual consumers, the most heartbreaking circumstances, which I think a home energy conservation program could address.

I get calls from a citizen with a $208 a month social security check, who has a $200 winter bill from a local utility that sells natural gas and electricity, and this citizen is living in a substan-

dard three-room apartment. That citizen does not even realize that that bill is grossly excessive for his or her needs. She has no ability to possibly pay it. She has no capital available to make any investment.

I could not be more sympathetic, from my practical experience, with the objectives of this measure. For that reason, I emphasize targeting assistance where no assistance is now available. I wholeheartedly agree with the thrust of your question.

Senator BRADLEY. Could you explain what difference it makes if the consumer will end up paying less with this plan than they would have without it? If they obtain a reduction of 50 percent in their consumption of energy, and they end up paying a slight increase in their assessment, but the total of that increase being much less than what it would have been without it?

Mr. WILNER. In your thorough cross-examination of the earlier witness, you examined a number of parameters and criteria for making a decision as to an appropriate Federal intervention and financing measure. You mentioned equity as an important consideration.

Senator, I sincerely believe that many citizens have realized in their own economic interest the importance of making investments in their own home energy efficiency. I don't believe that it is equitable for those citizens to pay for their neighbors who have the economic ability to insulate their homes, and who simply chose not to. I really feel I must represent the interests of those citizens who are prudent in making that investment.

In addition, I tried to point out in my testimony that the mechanism that you have selected, which must by its necessity be both an assessment against the regulated utility, which would then be appraised, as I understand your legislation, on a kilowatt hour of usage, or on consumption of natural gas, or something of that sort, of course, bears no relation to the investment. Not only do you have those already paying for the uninsulated, but you may well have those customers who receive little benefits paying a great amount, while those who receive great benefits pay a little amount.

That is my definition of equity, Senator, and for that reason I am afraid that I don't feel that many of the objectives which you agree should be served, are indeed served.

Senator BRADLEY. Could you tell me your estimate of the amount of individual initiative that has led to reduction in the residential sector?

Mr. WILNER. You were absolutely correct in your questioning earlier. I don't think that anything beats a free lunch. I agree wholeheartedly with you that if you beat on somebody's door, and you tell them that you are going to give them something for nothing, they will, indeed, accept frequently.

I think that the same thing is probably true of the United States and the citizens of this country when legislation is proposed on the same basis. But the initiatives and incentives do exist in our present system for those who are economically able.

What is required is, first, education and information for every citizen and, second, a financial mechanism for those who desire insulation, who need insulation, who live in a rented dwelling unit

that requires insulation desperately, and you do not have the financial ability to pay for is.

Senator BRADLEY. Just one more question related to the equity, a more general question of what equity you are seeking.

Do you believe that it is fair for people who do not have children to pay property taxes, school taxes?

Mr. WILNER. Yes, sir.

Senator BRADLEY. Do you believe it is fair for people who ride 2 miles to pay the same fair on a bus as people who ride 6 miles?

Mr. WILNER. Not necessarily, sir.

Senator BRADLEY. What is the difference between those two?

Mr. WILNER. We have not found a better way to tax for schools. We have found a better way to measure mileage, and to charge for riding a bus.

Senator BRADLEY. Have we found a better way to get residential energy conservation into the homes of the American people, to reduce our imports and their bill?

Mr. WILNER. I am here today because I think we are engaged in that search, Senator. I hope that we will all work together to get there.

Senator BRADLEY. Good. Thank you.

Do you have questions, Mr. Chairman?

The CHAIRMAN. Let me see if I understand your argument, and I think I do.

You are saying that when you go to measure the energy savings, it may be that a person is heating his house with fuel oil, or coal, and he is lighting his house with electricity. So if you are trying to charge off on the electric bill what you are saving in fuel oil, it is like trying to measure apples against oranges. There is no way to say, because the electric company would not have the records to show that this is where the savings occurred. Is that right?

Mr. WILNER. Yes, sir, Senator Long.

The CHAIRMAN. In my part of the country, specifically my own town, Baton Rouge, La., and I think that it is that way in a lot of other places, Gulf States Utilities provides us with both the electricity that goes into our homes as well as the natural gas. So the bill that they send us covers both.

So we are heating with the gas, and we are doing the air conditioning with the electricity, but in either event that same company had them both. They mail one bill that covers the whole thing. In that case, it would seem to me that you can measure the overall utility usage that is going to the house.

Mr. WILNER. Yes, sir. However, and by the way the largest utility in Delaware is also a dual utility, so I am familiar with those billing methods, the problem is that while the customer under this proposal, as I understand it, would have certainly accurate measurement by the utility of what had occurred in his dwelling, he would be paying through his electric and gas bill the assessment for insulating someone's home who uses fuel oil. Whereas the person who uses the fuel oil would not suffer the assessment since it is unregulated, and since there would be no assessment on a per gallon basis for fuel oil.

The CHAIRMAN. If you are doing that in my part of the country, and if the gas is separately provided, if you are in a position to put

the two together so that you are looking at the two bills simultaneously and they are both addressed to the same household so there is no reason why you can't put them both on the same computer. I am talking about a situation that is pretty typical throughout Louisiana, and that tier of States across there. He is not using the fuel oil. He is either doing it with electricity, or he is doing it with natural gas. It seems to me that in that type of a situation, you ought to be able to make it work, if it will work. At least that problem I don't think would keep it from working.

Mr. WILNER. Senator, if you are talking about the appraisal process, to find out what is happening in that home, I am in total agreement with you, and I believe that this is the greatest opportunity we have for informing citizens of how they are doing, and how to improve their dwelling unit.

As you know, because you have been getting computerized bills, almost all the data is in the computer bank. My offer to share with you a notion of how to do it better is that one takes the square footage of the dwelling unit, which is the one-time measure.

You then take the company record which ordinarily shows whether electricity is used for space heating, or whether natural gas is used for space heating, and you take that energy usage in kilowatt hours or in cubic feet, and you divide one into the other on a monthly basis, you can normalize for weather, if you really want to be fancy, and then you give every citizen, with a minute's work of the computer, a grading of how he or she is doing on a square footage basis against his neighbors.

I don't know that it will ever be a big subject at the country club on Sunday morning as to whether you are doing better than your neighbor, but certainly it would be a wonderful spur to citizens to push that ratio up, to perform very well. For that reason, I suggest that it is the most dynamic in-place, least expensive system which we have that is readily adaptable to begin to solve the first problem, which is information.

The CHAIRMAN. The question is, and I think that basically we are all agreed here with what Senator Bradley would like to achieve.

Mr. WILNER. Yes.

The CHAIRMAN. If it can be made to work, I think that it would be a great thing. I saw you smile over there when I mentioned it. This is a great idea if it will work. If it does not work, then it is like anything else that does not work. It did not work.

It does seem to me that if we experimented with it in areas where it is a publicly owned utility anyway, where the people of the community own it, I really don't see where anybody would have anything to lose in a situation like that. These publicly owned utilities are taking a real beating because of the increases in prices.

I have a cartoon in my pocket that someone handed me. This is a cartoon of two children who have just thrown a ball through the window, and it broke the window. This little fellow is saying to the other one: "There must be some way that we can blame this on the oil company."

Mr. WILNER. Or the utility, Senator. [Laughter.]

The CHAIRMAN. I tell you, the mayors of those communities that have those publicly owned plants, they have had a tough time. Many of them have not survived. It is awful hard to blame that on

the companies, even though they had nothing to do with it. It was the price of the energy going up.

Mr. WILNER. Yes, Senator, and you have made a very pertinent observation. Your little plants in Louisiana are primarily natural gas fired. In fact, I would even be willing to say that almost universally they would be fired with natural gas, because the natural gas is being purchased in Louisiana on the intrastate market. Because of the price acceleration in the intrastate market, everything you say is true with the terrible outcome.

The CHAIRMAN. I am thinking if you work it in a community where the people in the community own the plant anyway. It is their investment, and they own it. They have got to buy all the energy that comes in there. It seems to me that if you could send somebody around, and try to insulate, and to make more efficient all the homes in the community, it seems to me that they would all benefit.

Mr. WILNER. Yes, sir, and the question which I refer to as the ultimate financing method, I think is a primary concern. I appreciate, as Senator Bradley took great pains to point out, that this is a matter that has been under discussion with the administration. I know that it will obviously be under your review. I think that it is those elements which are of supreme importance.

I am entirely in agreement with your suggestion that we have to do the best job we can on insulation. It is the Senator's obvious great concern that we are not getting there, and we are not.

The CHAIRMAN. One of the questions that I have to ask about the thing, and the Senator has explained it to me a couple of times. I don't think that I am dense, or that anybody here is dense, but one of the Senators on this committee was making the point to me the other day that when people put on TV spots, they have to count on the audience seeing that spot eight times before the message finally gets through. Before the people understand what the message is, they have to see it eight times.

I am still a little bit confused, but I am sure that after I have been through it eight times, I will understand who is going to loan all this money. If we do it on a big scale, if we do it nationwide, it is a lot of money to borrow. If we are going to do this, we ought to find a way to see that someone will lend this money, and try to hold down the interest rate the best we can.

Does that bother you? Are you trying to figure that out yourself; or have you figured it out already?

Mr. WILNER. Senator, I am involved in the regulatory process for utility companies, and those numbers are small. those are just billion generators. You are asking me for familiarity with numbers that are bigger than I have day-to-day contact with.

The CHAIRMAN. Let me say again that I am troubled. I think that Senator Bradley has his idea of where to borrow it, and he is going to answer that in due course. But let me say this as the chairman of a tax writing committee, and also one who spreads some joy from time to time. We have some of those welfare programs so that from time to time we can do some nice things for people. If I had the choice between helping somebody borrow the money, or putting a new tax on the books, I would rather help someone borrow the dough, hoping that it would not be Uncle Sam

that had to lend the money. I'm thinking that we could maybe guarantee a loan, or help somebody to borrow the money. do you understand how that would be done?

Mr. WILNER. No, sir.

The CHAIRMAN. I will let Senator Bradley take care of that, but it is one of the problems as I see it.

Would you agree, though, that all things being equal, it would be better if we did not have to add that to the public debt, but if we could find someone who would lend the money, and if we could keep our liability to a minimum in doing it.

Mr. WILNER. I am sure that this must be a laudable goal, Senator, but you have a lot more experience in this than I do.

The CHAIRMAN. I would welcome help. But maybe Senator Bradley can answer that.

Senator BRADLEY. Sure. Do you want me to answer this now?

The CHAIRMAN. You can do it later.

Senator BRADLEY. Senator Wallop, do you have any questions?

Senator WALLOP. I have no questions. I find your testimony fascinating. Actually one of the areas in the country that is the most difficult to satisfy your concerns on is right here in Washington, D.C., where there are a lot of people who light and cool with electricity, who heat with oil, and who cook with gas.

My wife and I were looking at houses in the District, and we saw an incredible number of houses that used all three fuel sources. I assume that our experience was not unusual in the areas that we looked at. It is a complication, and something that we will have to deal with.

Senator BRADLEY. Let me just say that I appreciate Mr. Wilner's concern with equity, and I feel that I am equally concerned, and that the question of how you take care of the person who has already done some of the insulation while his neighbor hasn't, I think, is a relatively simple thing to take care of on the basis that the utilities do now, in estimating the amount of savings that will come from wall insulation, and various other kinds of insulation. It might be possible over a period of time just to write that person a check, so that he is taken care of, because the amount of that savings nationally is minimal when compared to the potential savings that can be created through this kind of delivery mechanism.

So I think his equity problems really can be taken care of, particularly when you consider the national goal of backing away from imported oil, and the individual who, assuming you did not write him a check, would still be paying a lower utility rate than he would otherwise. So he is marginally better off in that circumstance, even though he might end up paying a little bit more.

So I clearly can see your concern, and I appreciate it. I think that if you get together and work with this, you will find that we have anticipated a lot of questions that you have raised today. I would encourage you to call my staff as well as me at any time to discuss this matter because I am more than willing to do it, and look forward to your conversation because many of the questions that you have raised today have been anticipated and answered.

With regard to the question that Senator Long raised, which is where do you get the money, the answer is you get the money from the private capital markets. You get the money because you can

show that you have a profitable business going. The amount of money you get is infinitely less than the amount of money that utilities would have to raise to build new capacity throughout this country.

So all you have to do is look, as I have pointed out a couple of times, at a utility financial structure where the credit ratings have plummeted, and where their earnings cannot really cover their debt service to the degree that they did seven, eight or nine years ago. You will see that they are out there looking for some way that they can achieve these savings.

The CHAIRMAN. I don't have any doubt, Senator, that once you have proved it works, you will be able to borrow the dough. We have to find out whether it will work, and as far as I am concerned, I am perfectly happy to give you a chance to prove it, and let you pick the place where you think it will work best.

Senator BRADLEY. We will do one in New Orleans, and one in New Jersey, and also one in Wyoming.

The CHAIRMAN. Would you object to adding Baton Rouge on the list. We have a very nice community there.

It does seem to me that you are going to need a Government guarantee on your pilot project. Then if the pilot project works, I don't think that you will need the guarantee. But I think that you are going to need to have somebody do it, and say: "Yes, I have done it, and it works great." Then I think that you will be in business.

I will be a witness for you, Senator Bradley. I was trying to explain this idea to my wife last night, and she said: "Where are you going to get all these people to go out and do all of this?" I said:

You would be amazed at how many businesses are ready to go into anything that shows that they could make some dough, especially businessmen 50 years and over who are out of a job but who have a little money left over from the time when they did have a job.

You would be amazed at how many people are willing to go into something, especially if you could get Uncle Sam to put his name down there, and endorse that note for you.

Senator BRADLEY. We have done that to a certain extent here, because Uncle Sam has put his name on a line that says that he guarantees to buy energy if it can be generated at a specific price. What we have done is the same thing we are proposing in the synthetic fuel bill, to buy synthetic fuel at a specific price, and the Government is the guarantor of that price. That is what happens here with the price of saved energy.

So I appreciate your support of that effort. I might even consider further loan guarantees. But I think the important consideration is that clearly we have not in the residential sector what we can do, and that this is a mechanism to achieve those savings. It is complicated, but then a lot of good things in life are. This gives us a chance.

I agree with you, this is not something that is going to be national overnight, nor should it. I think that it should be tested, and we should give the private sector the opportunity.

Thank you very much, Mr. Wilner, and again I encourage you to talk to us because I think that we have handled your questions.

[The prepared statement of Mr. Wilner follows:]

THE BRADLEY PROPOSAL: AN APPRAISAL

(By Evan Wilner,[1] Public Advocate, State of Delaware)

Thank you for the opportunity to appear today at this critical time in your deliberations on our nation's energy tax policy—a time when energy matters are of major importance to every American.

As the statutory representative of all Delawareans concerning regulated energy matters, I am involved on a full-time basis with the problems facing individual consumers as they attempt to pay their utility bills. In the larger regulatory framework, I represent both small residential customers and giant corporations whose names are household words as prices are set for electricity, natural gas and telephone service.

My daily contacts with individual customers reinforce my judgment that the "Bradley" proposal addresses one of the most pressing and intractable energy problems facing citizens: how to determine what home conservation measures will be economically beneficial and how to pay for those improvements.

Conversely, my involvement in electric energy rate making proceedings as required under the Public Utility Regulatory Policies Act of 1978 suggests strongly that the ultimate financing method advocated in the Bradley proposal would negatively impact the utility regulatory process, significantly retarding the present trend to more equitable pricing of electric energy.

We should perservere in our search for ways to improve residential energy efficiency—with the knowledge that frequently those least able to pay suffer the most from inadequate energy conservation improvements to their dwellings. As we continue to make progress in this search, we should not adopt seemingly easy fixes which have significant negative impacts on other aspects of our national energy regulatory activities.

AN OVERVIEW OF THE BRADLEY PROPOSAL

At the time these remarks were prepared, I did not have access to a draft of the Bradley proposal and relied upon press reports and conversations with staff members. My remarks are intended to be generally descriptive and I would welcome correction of any errors resulting from those earlier reports of the proposal.

My understanding of the proposal—in oversimplified form—is as follows. Initially a corps or residential energy analysts and auditors would be created; they would survey homes and determine the costs and benefits or additional energy saving improvements. Under appropriate regulations as administered by designated agencies, energy saving improvements would be made to homes. The results of this work would then be audited, and if the improvements met stated standards the contractor would be rewarded through an assessment against the utility serving the dwellings in question. The utility then, classically, would recover the investment (assessment) through either an increase in its recognized operating costs or through incorporation of the investment in its rate base.

The justification suggested for the ultimate recovery of conservation investments through the utility mechanism is the asserted avoidance of massive new generating plant investments. Transfer of these costs to all utility ratepayers is assertedly more than offset by savings flowing to all utility customers from reduced capital investment.

ANALYSIS OF THE REGULATORY IMPACTS OF BRADLEY PROPOSAL

The regulatory aspects of the Bradley proposal are logically elegant and symmetrical. However, close analysis of the regulatory process and home energy usage provides little support for either the logical linkage of the factual relationships asserted.

Simple familiarity with the diversity of home energy sources demolishes the notion of easy one-to-one relationships: electricity and natural gas are typically regulated commodities; fuel oil and propane are not. Again, natural gas is overwhelmingly used in the home for space heating; electricity is not. The nature of our housing inventory and its present energy efficiency is similarly heterogeneous: old and new home furnaces, good and bad weatherization, little correlation between

[1] Mr. Wilner is the First State's first Public Advocate, having been appointed by Gov. Pierre S. du Pont in January 1979. Prior to his appointment he served as counsel to the Michigan Public Service Commission.

income level and home expenditure for regulated natural gas, at least. State-by-state there are great differences in the amount of industrial energy use compared to residential consumption.

How is a single financing measure—or even a hybrid system—ever going to combine this diversity into a single calculable balance of costs and off-setting revenues? Do presently insulated homes receive some form of credit against the differential assessment for added insulation of the non-insulated? Do large electricity users pay a large share of the differential assessment—while those using a non-regulated fuel (or even natural gas) escape assessment while enjoying the benefits of a newly energy efficient dwelling? Will the proposed excess profits tax on oil production be fine tuned nationally recover insulation costs from users of fuel oil, while the local utility regulatory process will impact upon electricity and natural gas customers?

The simplistic notion that improved home conservation will defer additional utility electric plant construction and thereby in and of itself lower electric costs is questionable on a number of grounds. In may eastern states there is presently ample generating capacity to meet winter electric demand. New electric heating demand frequently originates from new home construction; ample economic incentives should be present today to stimulate a high level of initial energy conservation in such dwellings. The most recent United States Department of Energy regulatory participation suggests that new non-oil fired generators are economically beneficial as one-for-one replacements for existing oil fired electric generators, even if the additional units are not required to meet new peak demands. On many summer peaking electric systems, the winter electric load is beneficial in providing optimum year-round use of generators.

THE RESIDENTIAL ENERGY CONSERVATION POTENTIAL

Surveys have confirmed intuitive appraisals of the enormous potential for additional residential energy conservation. This committee has begun the process of furnulating effective national policies to maximize conservation through selective tax credits—but much more needs to be done.

I will not impose upon your time to outline recent national initiatives in this area; suffice to say there are elements spurring conservation in the Public Utility Regulatory Policies Act, the federal weatherization program and the like. These efforts are not enough to get the job done.

The Bradley proposal properly recognizes that scientific knowledge must be joined with economic evaluation and practical action to achieve satisfactory results—it is founded upon a recognition that additional funding mechanisms must be utilized to reach all segments of our society with these improvements. My own judgement is that we can greatly improve the initial energy audit process now being put in place under PURPA to furnish economically justified recommendations to each homeowner. Especially with regard to the use of natural gas and electricity, the existing billing data collected by public utilities can be easily adapted to give customers a month-by-month reading of home energy efficiency—right on the utility bill.

Perhaps naively, I would hope that we can target the low income homeowner, the renter, and rental property owners who are not now able to achieve or perceive the benefits of added home energy conservation. I wholeheartedly believe that needed improvements in the regulatory process can and should be made to reshape energy regulation in the interests of maximum consumer information, choice and energy efficiency.

Senator BRADLEY. Now we do have one more witness on a related matter, a different bill of great concern to Senator Wallop, and that is Mr. Thomas Singer, and I would like to call him now to the front, to offer his testimony.

I will let Senator Wallop take over now, and explain his bill.

Senator WALLOP. Thank you, Mr. Chairman.

This is the bill that Senator Simpson and I introduced, which is the so-called Kaiser, which is a means by which we think we can encourage major energy users in the country to invest in energy saving devices which are cost effective. It fits into the existing tax laws of the country.

I have a statement, which I will put into the record, on this.

Essentially what we have here is a very interesting and potentially productive and a rather modest cost program which has been devised here, and I think that it is of considerable interest.

[The prepared statement of Senator Wallop follows:]

STATEMENT OF SENATOR MALCOLM WALLOP

Mr. Chairman, the Committee on Finance and the Congress as a whole are attempting to put together a series of proposals that will help this nation and its dependence on foreign oil. The thrust of our action is properly divided between increasing energy production from both conventional and alternative resources and conserving energy both at home and in industry. As a vigorous growing nation we have long been accustomed to proposals that increase production. Tax incentives to encourage oil and mineral exploitation have long been a part of the tax code, and the nuclear industry has benefited from government support since its inception. Unfortunately we have less experience and understanding of the means available to this nation of encouraging conservation of scarce natural resources.

Today Senator Bradley and I are presenting two new proposals to conserve energy. I am pleased that the Committee has given Senator Bradley an opportunity to further explain his proposal to accelerate the process of residential energy conservation. Clearly, if we are to achieve our energy conservation goals we must be ready to explore new ideas such as those proposed by Senator Bradley in S. 1800.

Today the Committee will also have an opportunity to review the Industrial Energy Conservation Incentive Tax Act, S. 1819, which I have introduced along with Senator Simpson. This legislation is designed to achieve savings in industrial energy use that could not be achieved under the present system of energy investment tax credits. It is important to state at the outset that this proposal is designed to make the best use of government funds in encouraging industrial conservation. We are looking toward not only efficiency in industry, but new methods of measuring and achieving cost effective incentives provided by the government. Setting this goal demands that we take new innovative approaches to the challenge of energy conservation.

Industrial conservation efforts already undertaken have produced significant energy savings, but there is a potential for substantial additional savings to be achieved with existing proven technology. Projects to achieve these conservation savings are in many instances not going forward today because the capital required for them is such that they do not produce an adequate real rate of return on investment. As the price of energy continues to rise, many of these projects will utimately be undertaken. However, for the decade of the 1980's, incentives are needed if these conservation projects are to be undertaken.

The Industrial Energy Conservation Incentive Tax Act is designed to stimulate these projects by providing tax incentives which are sufficient to produce an adequate real rate of return on investment, but only where the granting of such tax incentives is "cost effective" to the Nation. A project would be considered cost effective to the Nation in all cases where the cost of the energy conserved by the project is less than the cost of producing an equivalent amount of energy from an alternative energy source. For simplicity, that alternative cost is set at a uniform figure of $32 in the bill.

Under this legislation, tax incentives would be made available for industrial conservation projects which, first, modify or replace all or part of an existing domestic productive facility; second, result in the utilization of less energy, other than coal, per unit of production; and third, to not increase the amount of oil and gas consumed per unit of production. The legislation thus applies both to projects which result in more efficient use of energy and to projects which involve conversion to coal. In addition, the bill specifies a minimum level of energy savings. Incentives will be available only if there are quantifiable energy savings.

Once these initial tests have been met, tax incentives would be available but only if they are necessary to enable the taxpayer to realize a specified real rate of return on the project, and even then only if the granting of the incentives is cost effective to the Nation. If the energy savings entailed in a conservation project will provide a 15 percent real rate of return on investment, then there is no need for an investment incentive from the Government, and the tax credit is denied. There is no need to provide Government funds for conservation projects that would proceed without Government grants or tax incentives. There two concepts are designed to assure that we achieve the maximum possible energy savings for each dollar of tax incentives.

The tax incentive is cast as a refundable additional investment tax credit, and amount of the additional credit is in each case to be equal to that necessary to enable the taxpayer to realize a real rate of return of 15 percent on the capital invested in the project. The amount of the additional credit, which cannot exceed 30 percent, is determined by a formula which takes into account all of the costs and benefits of the project, including energy savings, existing tax incentives, and increases in production or capacity. Thus, the credit allowed will vary from project to project and will in all cases be equal to that necessary to produce the target real rate of return of 15 percent, but no more.

A central feature of this legislation, Mr. Chairman, is that the tax incentives, even if needed by the taxpayer to produce a 15 percent real rate of return, will not be made available unless it is cost effective for the Nation to do so. Whether the granting of incentives for a particular conservation project is cost effective to the Nation is determined by comparing the cost of the energy saved to the cost of producing synthetic fuels. This is called the alternative energy cost.

For simplicity, the bill sets the alternative energy cost at $32 per barrel of oil equivalent. This figure would increase with the price of oil. So long as the conservation price is less than the alternative energy price of $32, the granting of incentives for the project is cost effective to the Nation. However, if the conservation price exceeds the alternative energy price, granting of the incentives is not cost effective to the Nation and the incentives are, therefore, to be denied.

Cost effective incentives for industrial energy conservation are a necessary part of any effective short-term strategy to reduce our growing dependence upon imported energy. Such savings can be achieved with existing technology, but only if we are prepared to meet, on a cost effective basis, the need to provide capital, through incentives, for qualified conservation projects. More is involved in these projects than improved operating procedures and relatively minor modifications to existing equipment. What is now involved are costly projects to replace existing equipment or modifying processes to reflect current energy efficient technologies. Carefully tailored incentives can stimulate these projects and result in increased energy savings.

This legislation is designed to meet these goals. Undoubtedly, as with any legislation, further refinements and improvements can be made as the legislative process moves forward. I look forward to working with my colleagues on the Finance Committee in fashioning the best possible response for cost effective tax incentives for industrial energy conservation.

STATEMENT OF THOMAS K. SINGER, VICE PRESIDENT, KAISER ALUMINUM AND CHEMICAL CORP., ACCOMPANIED BY DONALD MOOREHEAD

Mr. SINGER. Thank you, Mr. Chairman.

My name is Tom Singer, and I am a vice president of Kaiser Aluminum. With me is Don Moorehead, a partner in the law firm of Sutherland, Asbill & Brennan, who are the energy counsel for Kaiser.

We appreciate the opportunity to testify in support of Senator Wallop's bill, S. 1819. I think I will try to abbreviate my testimony, and submit the full testimony for the record.

Let me say at the outset, Mr. Chairman, that our interest in this subject of industrial energy conservation is neither new nor academic. Kaiser Aluminum operates 71 manufacturing plants in 30 different States, and most of our business requires a lot of energy. We rank in the top 25 energy consuming companies in this country.

We have been actively studying the subject of industrial conservation for more than 5 years now, and we believe that legislation such as proposed in S. 1819 must be an essential part of any effective short-term energy strategy.

I would have to say, in our judgment the case for conservation, whether it should be residential, like you have offered, Senator

Bradley, or whether it is industrial, such as in the Wallop bill, is self-evident simply because there are so few other options.

Our studies indicate that there is a significant potential for energy conservation and that the realization of a significant portion of these conservation savings could be accelerated by properly conceived and carefully tailored incentives.

This conservation potential is illustrated in exhibit 1, which is the second from the last page of the testimony. The first level of industrial energy conservation, about 10 percent, involves modest capital requirements and comparatively minimum new technology. It is located at the bottom of the chart.

With increases in energy prices, these first level projects have increasingly become cost effective. Certainly, in our industry, the aluminum industry, and we believe in other industries as well, these first level projects have been and are being realized.

Our studies also indicate that in the energy intensive industries, such as ours, there is another 15 to 20 percent conservation potential, which could be obtained with existing technology, but which requires substantial capital investment. These projects, which are represented by this shaded area, the middle area, will be implemented sometime in the future, but they are not being undertaken today. In our judgment, one of the principal reasons why they are not proceeding today is that they are not currently cost effective to the industry. In other words, the return on investment is not adequate to justify the capital expenditure required to implement these projects in the middle band.

Our studies have led us to conclude that properly tailored tax incentives can reach these second level projects, and harness the significant energy conservation potential they represent.

The conclusion that we have reached with respect to the need for these tax incentives to promote industrial energy conservation projects parallels the conclusion that the authors of this book—which you may have seen—"Energy Future" by Professors Stobaugh and Daniel Yergin of Harvard have concluded in their book.

Specifically, they state on page 162 of this book, and I just want to quote three sentences.

> The 1978 National Energy Act provides a 10 percent tax credit for conservation investment. But given the subsidies and external costs of other energy sources, as well as the high hurdle rates, 10 percent seems much too low. Significantly greater tax credits, up to 40 percent, plus accelerated depreciation and energy conservation loans, are required.

Let me turn to Senator Wallop's bill, S. 1819, which provides for refundable additional investment tax credit, not to exceed 30 percent, for qualified industrial energy conservation projects.

We fully support S. 1819 for two principal reasons. First, it provides the very type of incentive needed to stimulate energy conservation projects which are not now being undertaken. Second, it provides such incentives in a cost-effective manner from the Nation's standpoint. In that respect, it has a similar thrust as the Bradley bill.

As to the first point, I reflected earlier our conclusion that a principal deterrent to such projects is that they are not now cost effective to the business concerned. S. 1819 directly addresses this problem by providing an additional investment tax credit sufficient

to produce a 15-percent real rate of return on the capital investment.

In our judgment, this approach to the calculation of the incentive is both administerable and greatly preferable to the flat percentage approach which has been looked at in the past. Use of the flat percentage approach will in some cases grant a credit for something that the taxpayer would do in any event, and I am going to show you an example from our own company of that case. In other cases, the flat rate would involve a credit wholly inadequate to justify undertaking the energy conservation project.

In contrast, a variable credit as offered in Senator Wallop's bill is vastly preferable. Under this bill, no credit will be granted unless it is necessary to enable the taxpayer to realize a 15-percent real rate of return, and then only to the extent necessary to produce that rate of return. This feature maximizes the energy saved for each dollar of incentive provided by the Government.

If it turns out that the project does not save any energy at all, there will be no credit. The Government has lost nothing. So it seems to me that every dollar that the Government invests in this incentive program will, in fact, produce energy savings.

S. 1819 is also cost effective from a national standpoint. Under this bill if a credit is needed by a taxpayer to produce this 15-percent real rate of return on a particular project, that credit will not be made available unless the cost of the energy saved by the project is less than the cost of producing the equivalent amount of energy from an alternate domestic source.

Under the bill, once the taxpayer had determined that he was entitled to an additional tax credit, let us say 12 percent additional ITC, to produce a 15-percent rate of return, he would then calculate the price at which the energy saved by the project would have to be sold in order to produce a 15-percent real rate of return. This is called the conservation price in your bill. It would be expressed in terms of dollars per barrel of oil equivalent, and would be compared with the cost of producing the same amount of energy from an alternative domestic source.

For simplicity, S. 1819 sets this alternative energy cost equivalent at $32 per barrel of oil.

Senator WALLOP. That is the figure that the President's original proposal selected for synthetic fuel.

Mr. SINGER. If the price of the conservation exceeds that $32 per barrel, then there would be no credit. If the price of the energy conservation is less than $32, and therefore a good deal for the Government, the credit would be available, but as I said, only to the extent necessary to get up to that 15-percent threshold.

To summarize, Mr. Chairman, we believe S. 1819 merits support for three reasons. First of all, the incentive is available only if there is a quantifiable energy saving per unit of production.

Second, the incentive is available only where the project would not otherwise produce a 15-percent real rate of return, and only on a variable basis, so that you would only have an incentive that is necessary to get to the 15 percent.

Third, the incentive is available only where the energy saved is cost effective to the Nation. To that extent, as I said, I think that it has a similar thrust as your bill. If the energy saved by the indus-

try is too costly, the taxpayer does not qualify, and the Government avoids the cost and possible embarrassment of finding itself having subsidized an uneconomic energy project.

Mr. Chairman, let me now illustrate the impact of S. 1819 by reference to four actual energy conservation opportunities in our company, Kaiser Aluminum, and they are on exhibit 2, which is the last page of my testimony.

These are all projects which are cost effective from the national standpoint, since the energy savings that they would produce can be attained at less than the $32 per barrel of oil equivalent which was previously referred to.

As you will see, the second from the last column is the conservation price, and the final column is the alternative energy price of $32.

However, in some cases these projects are not going ahead, because they are not economical. For instance, I would like to draw your attention to project No. 3, which is in the shaded area. It is a project which provides 22 percent savings in electrical energy. Actually in that particular project there happens to be a lot of electrical energy, about 115 megawatts.

The capital required to implement this project, as you can see, is $360 million. But the bad news is that the return on investment is 6.9 percent, which of course is much below our rate.

The conservation price shown in the second from last column is $20 per barrel of oil, thus the energy saved by project No. 3 would be cost effective because it is cheaper by $12 a barrel than the equivalent energy by way of domestic alternative.

As you can see, the return on investment for project No. 3 is too low for us to implement this project without incentive.

The CHAIRMAN. Let me ask you about that. Can you tell me what that project is, and what type of thing it is? I guess you have a project in mind.

Mr. SINGER. This is a specific project, and it happens to be an aluminum smelter modernization. This particular project is in the State of Washington. We have one very similar to it in the State of Louisiana, except that it is bigger, because our biggest smelter, as you know, is in Chalmette, outside of New Orleans.

The CHAIRMAN. The kind of thought that occurs to me. You have got a big plant down there. The output here is molten aluminum pouring out. You take that, and put it into pig form, don't you?

Mr. SINGER. We produce it in shippable form, whether it is a pig or a sow, or sometimes a semifinished product such as electrical conductor, which we make down there.

The CHAIRMAN. You don't make many finished products down there?

Mr. SINGER. We do not, no, sir.

The CHAIRMAN. The thought occurs to me that it would save just a tremendous amount of energy if while that stuff is in its molten form, you could go ahead and pour it into a bunch of shapes, or roll it into sheets, so that would save all the energy in heating it up a second time. That, to me, is obvious on the face of it a fantastic saving of energy.

Mr. SINGER. There is no question, Senator Long, that the use of so-called hot metal is energy efficient. In our particular product

mix, we sell about 75 percent of our product in a further fabricated form, and about 25 percent goes in the form that it is produced at the smelter. In other words, a pig, or sow, or a billet.

In the case of our other two large smelters, we do have hot metal transfer in the State of West Virginia, where we have one of our largest rolling mills, which happens to be within 500 miles of 70 percent of the aluminum market. So you save some energy on delivery there.

In the case of the plant in New Orleans, we ship a lot of our primary products that do not get transformed, some of it abroad for export, which helps our balance-of-payment problems, and some of it to customers in the United States. Certainly there is a portion of that that could profitably be converted closer to the smelter.

The CHAIRMAN. You have a bunch of empty barges. You can look out of the window of one of those hotels in New Orleans, and see those barges coming down with coal, most of them are going back upstream empty. So far they have not made you burn coal in your plants, have they?

Mr. SINGER. We are not burning coal. We are burning natural gas.

We use those barges, incidentally, to send aluminae up from the Baton Rouge refinery up the Mississippi River to the Ohio River, to make deliveries up in the Midwest.

The CHAIRMAN. In any event, barge transportation is relatively cheap transportation, and you are right down on deep water also, so that you could move some things around relatively cheaply, I would think.

The point is, you would save a lot of energy if you could make the aluminum in the final shape while it is still hot. That is the point.

Mr. SINGER. I agree with you. I think that we would save some energy. I think the greatest energy potential in the State of Louisiana, and incidentally half of the energy we consume is in your State, Senator.

The CHAIRMAN. We produce it there, you know.

Mr. SINGER. That is right, you produce it there, and we consume it there. As you know, this is why Mr. Kaiser came there during the Korean war in the first place.

The greatest potential we have would be to modernize a smelter like Chalmette, which now uses about 8 kilowatt hours per pound of aluminum, and put in best available technology which already exists, not taking any great risks on the technology, and it would produce at about 6.3 kilowatt hours per pound. So it is about a 23- to 24-percent savings.

There is a 550 megawatt plant, so 22 percent of that is 125 to 130 megawatts which is a large amount of power, as you know. Five hundred fifty megawatts of power is sufficient to supply a city of a million to a million-and-a-half people.

So while I take your point, and I agree with it, the big savings would be in putting in modernization of smelters which would be certainly assisted by Senator Wallop's bill.

I think that we have covered the ground as far as our opinion on the bill. We think it draws the very types of distinctions that should be drawn for industrial energy incentives. We think it

channels incentives into energy conservation projects where a boost is needed to make them economical. Most importantly, from the national standpoint, we think it produces energy savings for the country on a cost-effective basis.

I must not leave out the fact that I think it can be effective in the near term. In the next 10 years, we are not going to get much from synfuels. I think a problem remains with nuclear energy, that remains uncertain. We need something to bridge the gap between now and the time that the new technologies are going to provide us with substantial energy.

I think that those, like Senator Bradley's bill, which addresses the residential sector, and like yours, Senator Wallop, which addresses the industrial sector, can give us a very substantial amount of energy in this next to 10 to 15 years.

The CHAIRMAN. Let me ask you one more question about that.

I assume that you will have to borrow some money to do this thing. You get a tax credit, but you will need to borrow.

Mr. SINGER. We cannot do all this out of cash flow. We will borrow some. We have a debt to equity ratio of about 35 to 40 percent debt, and the balance equity. I would assume we would do it on that sort of a basis.

The CHAIRMAN. In other words, you are asking for a big tax credit, but you think if you could get the tax credit, you could take care of the rest of it?

Mr. SINGER. If we get the tax credit, and if we can raise the sufficient capital, I would say that we fund a great many projects. We, perhaps, would not be able to do them all in the same year, and we would have to schedule them out.

Senator Wallop: The one interesting thing about it is, they ask for a big tax credit, but they don't get it until they have demonstrated the savings. So that the Government runs no risk at all in this business. They run all the risk, and if they cannot demonstrate the savings, they plainly don't get anything no matter what they have done.

Mr. SINGER. That is right.

The CHAIRMAN. You know, I am for a refundable tax credit. You are familiar with that. You have Don Moorehead with you, and I am sure that he recalls it. He used to work for the Republicans here, but if he wants to come back and work for the Democrats, we will hire him.

Mr. SINGER. We don't want to let him go right away. He is busy working for Kaiser, Senator Long. [Laughter.]

The CHAIRMAN. He recalls very well the fight that we had over that refundable tax credit down through the years. The Appropriations Committee gets rather jealous of us using that. They feel that we are doing things that they ought to be doing.

If we gave you a tax credit against the money you pay in social security taxes, the employer part, as well as the part your pay on income taxes, or any taxes that you pay to the Federal Government, could you handle that out as a credit against taxes that you pay?

Mr. SINGER. Senator Long, I think that you could handle it in that fashion, leaving aside how the numbers worked out, and whether you needed refundability in addition to that. But certainly

the way the investment credit is structured now, of course, it is just the income tax, but there is no reason that the investment credit could not be applied to a broad-based definition of Federal tax liability, whether income or otherwise.

The CHAIRMAN. If you carried it forward, you could take it against your social security taxes as well as against the income tax, and any other Federal tax you pay. I assume that you ought to be able to find a way to take care of this.

Mr. SINGER. It would certainly be a possibility worth exploring.

The CHAIRMAN. I just think that the Appropriations Committee ought to get with us on the basis of refundable tax. That way, you could give a businessman more certainty than he has otherwise. If he has to go back and hope to get annual appropriations, and then if you meet with one of our economizing friends up there who say: "Hold on just a minute, these people don't have to have that this year. Postpone it, or stretch it out, or pay it some other time, not this year." Businessmen can't count on it. But if you have it as a refundable tax credit, they can count on it. I think that it is a great way to give someone the assurance that he is supposed to have, and to deliver when we are supposed to deliver.

I know you favor that, but it will take a lot of help from business to get the votes in the Senate to move forward as we should with refundable tax credits.

Senator WALLOP. Incidentally, in this one instance, this proposal has a justification that goes beyond the business predictability of it, and that is guarantee of the Government that it has not bought a pig in a poke by. They have to demonstrate the success of their proposal, and measure it against the threshold price before the government has any obligation whatsoever.

Mr. SINGER. That is true. But I must say that Senator Long's point is very important because you have to have a high degree of certainty if you are going to go ahead on a 15-percent project with the prime rate as it is today. A 15-percent project is not all that hot, you know. So if there is a lot of uncertainty, you say. "Well, I have to have 20, 25, or 30 percent." So I think that it would be very important to have that feature in the legislation.

Senator WALLOP. Mr. Singer, I have several questions, some of which I will submit for the record, because it is getting late.

When you talk about the potential for energy savings, obviously I think there is a great potential, and I have a figure in my head. But what in your mind would be the energy savings that could be achieved if legislation similar to S. 1819 were enacted.

Mr. SINGER. We have taken a look at that, Senator Wallop, and we think there is a potential there for up to 2.5 million barrels of oil per day, which compares with our imports which are about 18 million barrels per day. There is approximately 37 million barrels per day of energy equivalent used in the country, and 36 percent of this is in the industrial sector. So that is about 13.3 per day, and if you agree with my testimony in the first chart, where I indicated we felt there was 15 to 20 percent available, and perhaps there is more.

Senator WALLOP. It is marginally profitable.

Mr. SINGER. That is right.

Senator WALLOP. Marginally economic.

Mr. SINGER. It would be brought in by this type of proposal, and that would amount to between 2 and 2.6 million barrels per day. As I have said, in round numbers is it up to 2.5. We are working with consultants to try to refine that number.

Senator WALLOP. This is in the time frame of a decade?

Mr. SINGER. Yes. I think by the end of the decade, you would be getting up toward your full potential. It would take sometime to get there because the projects would have to be developed and engineered, and be in place.

Senator WALLOP. One of the things that that concerned the committee, Senator Bradley and myself, throughout these so-called energy markup sessions is the notion that we may be going to give a tax incentive for something that the taxpayer would do anyway.

It is my opinion that my bill is not subject to this criticism. I wonder if you would agree with that?

Mr. SINGER. Yes; I would agree with you, Senator, your bill does not provide a tax credit at all if the project is going to yield a 15-percent or higher return. So those that are going to go ahead are normally in that category anyway. As I said earlier, very few people are going to go ahead with a project less than 15 percent return with the interest rates the way they are today.

Senator WALLOP. Those are 10 percent of the projects that are currently underway.

Mr. SINGER. All of those, in our opinion, have been 15 percent and over.

Senator WALLOP. Let me ask you one other thing. It is my opinion that you have discussed the essential approach taken in this bill with Professor Stobaugh.

Mr. SINGER. Yes.

Senator WALLOP. Having had that conversation, is it your opinion that Professor Stobaugh would find S. 1819 to be consistent with the ideas that are presented in his book?

Mr. SINGER. Of course, I cannot speak for Professor Stobaugh, particularly because he is in China at the moment, on a trip to look at their energy problems, but I did spend 2 hours with him and Daniel Yergin, who is the coauthor of this book, on the 14th of September, and they definitely felt that the concepts which we were discussing, which are now embodied in your bill were exactly what they were talking about in their book. I asked them, if indeed this became a proposal in Congress, would they be willing to testify, and they said that they would be delighted.

So I would suggest, if you have any further hearings, either Professor Stobaugh or Professor Yergin would be good witnesses, As you know, they come down strongly on conservation, both residential and industrial, as the solution to our national problem.

Senator WALLOP. There is only one other thing that I would like to ask. The bill provides for progress payment of the energy credit, and means that those progress payments will be based to some extent on the taxpayer's estimate of the savings to be achieved. But it also provides for a recomputation of the credit after the project is completed.

Would you consider this to be an adequate safeguard for the interest of the taxpayers?

Mr. MOOREHEAD. I would. As you well know, if the tax-payer buys a piece of equipment, and he is entitled to the accelerated depreciation, or the regular investment credit. Those tax benefits are premised on the notion that you, as the taxpayer, would keep those for the most if not all of their useful life. If you turn around and sell it real quick, Congress, in effect, has provided for a recapture of those tax benefits.

S. 1819 provides for essentially this same type of approach. To stimulate these projects, some of which may have a 2- or 3-year leadtime in terms of construction, the incentive would be made available as the construction period goes forward. Once you have been in operation in for a period of at least 18 months, estimates that you made would now become known factors. How much did this project really cost versus your estimate? How much energy is, in fact, being saved? Is the Government, in fact, getting the energy savings that it bargained for in this project?

You recalculate at this point in time using known factors rather than the estimates. If, in fact, you did not save any energy at all, or if, in fact, when you recalculate you have too big an incentive, the Government recaptures that incentive just as it would recapture any other incentive that it gave in the accelerated depreciation in the investment credit area.

I think frankly that that provides the type of safeguard that the committee and the Congress ought to have if it enacts this type of incentive proposal.

Senator WALLOP. With the prime rate at 13 percent, is the 15-percent guarantee a sufficient inducement to begin to find the kinds of energy savings that we are looking for?

Mr. SINGER. It is a very good question, and it will depend on the investment decisions by various companies. I would say that it is at the very low end of the range, and that the Congress might want to consider something a bit higher than that. Once you got started with a program like this, you could see how well you were doing after a year or two and make some adjustments.

I would say, for our company, on a real rate of return that discounts inflation, the real rate of return, some of these projects would really go forward if we had your bill.

Mr. MOOREHEAD. May I add a 10-second comment. With the type of bill that you are talking about, and the type of approach that Senator Bradley is talking about, which are more sophisticated, or second-generation approaches to the energy problem, it seems to me that you are going to have a duty, if these go forward, to have some kind of oversight function.

It seems to me setting the rate of return at 15 percent is a good starting place. If you would set it today at 18 or 19 percent, or 20 percent, you would capture more projects than you will capture with 15, there is no question about that. But it might, in terms of prudence, be best for the committee to start at 15 and if in oversight hearings, which are held next year, or the year after that, a different percentage was indicated, then that is the type of thing that you ought to look at at that time.

[The prepared statement of Mr. Singer follows:]

TESTIMONY OF THOMAS K. SINGER, VICE PRESIDENT, KAISER ALUMINUM & CHEMICAL CORP.

Mr. Chairman, my name is Thomas K. Singer. I am a Vice President of Kaiser Aluminum and Chemical Corporation. With me is Donald V. Moorehead, a partner in the Washington law firm of Sutherland, Asbill & Brennan. We appreciate this opportunity to testify in support of S. 1819, the "Industrial Energy Conservation Incentive Tax Act."

Let me say at the outset, Mr. Chairman, that our interest in the subject of industrial energy conservation is neither new nor academic. Kaiser Aluminum operates 71 manufacturing facilities in 30 states. In addition to aluminum, we produce refractories, industrial chemicals and fertilizer, all products which require large quantities of energy. We consume more than 200 trillion BTUs of energy each year, which places us among the top 25 energy consuming companies in the country. The major form of energy which we consume is electric power generated from natural gas, oil, coal, and hydro power. We have actively studied the subject of industrial energy conservation for more than five years and we believe that legislation such as S. 1819 must be an essential part of any effective short-term energy strategy.

The United States now confronts an energy problem that is becoming more severe each day. We must now devise and implement strategies to solve our energy problems in ways that will not have adverse economic implications in terms of employment, productive capacity, and competitiveness in the international marketplace. In the short term, that is over the next decade, our national strategy options are few in number. Widespread production and industrial use of synthetic fuels, solar energy and other alternative energy sources remains at least a decade away, and the role to be played by nuclear power remains uncertain, particularly in the short term. Governmental encouragement of efforts to develop synfuels and other alternative energy resources is needed, but this is a long-term strategy for the 1990's and beyond.

In the short term, to decrease our dependence upon imported energy requires increased production of domestic fuels and stimulation of significant additional energy conservation. Increased production is important, but it is not a substitute for the more efficient use of our existing energy resources. In our judgment, the case for conservation is self-evident simply because the other short term options are so few.

Our studies indicate that there is a significant potential for industrial energy conservation and that the realization of a significant portion of these conservation savings could be accelerated with carefully tailored incentives.

This conservation potential is illustrated in Exhibit 1 to my testimony. The first level of conservation savings—about 10 percent—involves modest capital requirements and comparatively minimum new technology. With increases in energy prices these first level projects have increasingly become cost effective. In the aluminum industry, and we believe in other industries as well, these first level conservation savings have been and are being realized.

Our studies also indicate that in the energy intensive process industries such as ours, there is another 15 to 20 percent conservation potential which could be obtained with existing technology but which requires substantial capital investment. These projects, which are represented by the shaded area in Exhibit 1, will be implemented sometime in the future but they are not being undertaken today. In our judgment, one of the principal reasons projects are not proceeding today is they are not currently cost effective to industry, i.e., the return on investment is not adequate to justify the capital expenditure.

There is a third zone above the shaded area which represents additional long term conservation potential which is dependent upon the outcome of research and development efforts to develop new technologies. These research and development efforts are very important and must also be stimulated, but conservation savings in this area are not likely to be achievable in the short term. Thus, if we are to realize significant additional industrial energy conservation savings over the period of the next decade, our focus must be upon those "second level" projects represented by the shaded area in Exhibit 1. These are projects which have relatively low risk since they do not involve any major new technology. However, as I have indicated, the return on most of these projects is simply too low to justify the investments. Many of these projects will be cost effective in time, but not in the short term. Our studies have led us to conclude that properly tailored tax incentives can reach these "second level" projects and harness the significant energy conservation potential they represent.

The conclusion we have reached with respect to the need for tax incentives to promote industrial energy conservation projects parallels that reached by Messrs. Stobaugh and Yergin in Energy Future. Specifically, they stated on page 162 of their recently published book:

"The 1978 National Energy Act provides a 10 percent tax credit for conservation investment. But given the subsidies and external costs of other energy sources, as well as the high hurdle rates, 10 percent seems much too low. Significantly greater tax credits, up to 40 percent, plus accelerated depreciation and energy conservation loans, are required."

Let me now turn to S. 1819, which provides for a refundable additional investment tax credit (not to exceed 30 percent) for qualified industrial energy conservation projects. We fully support S. 1819 for two principal reasons. First, it provides the very type of incentive needed to stimulate industrial energy conservation projects which are not now being undertaken. Second, it provides for such incentives in a cost effective manner from the nation's standpoint.

As to the first point, I have reflected earlier our conclusion that a principal deterrent to such projects is that they are not now cost effective to the businesses concerned. S. 1819 directly addresses this problem by providing an additional investment tax credit sufficient to produce a 15 percent real rate of return on the capital invested. In our judgment, this approach to the calculation of the incentive is both administerable and greatly preferable to the flat percentage approach to industrial energy credits used in the past. Use of the flat percentage approach will in some cases grant a credit for something the taxpayer would do in any event and in other cases the flat incentive would involve a credit wholly inadequate to justify undertaking the energy conservation project.

In contrast, a variable credit tied to a rate of return on investment, like that in S. 1819, will avoid these problems. Under this bill, no credit will be granted unless it is necessary to enable the taxpayer to realize a 15 percent real rate of return and then only to the extent necessary to produce that rate of return. This feature maximizes the energy saved for each dollar of incentive provided by the government.

Mr. Chairman, S. 1819 is also cost effective from a national standpoint. Under this bill, even if a credit is needed by a taxpayer to produce a 15 percent real rate of return on a particular project, that credit will not be made available unless the cost of the energy saved by the project is less than the cost of producing the equivalent amount of energy from an alternate domestic source. Let me explain how this "cost effectiveness" limitation would work.

Under the bill, once the taxpayer had determined that he was entitled to an additional tax credit (say 12 percent) to produce a 15 percent real rate of return, he would then calculate the price at which the energy saved by his project would have to be sold in order to produce a 15 percent real rate of return. This "conservation price" would be expressed in terms of dollars per barrel of oil equivalent and would be compared with the cost (also expressed in terms of dollars per barrel of oil equivalent) of producing the same amount of energy from an alternate domestic source. For simplicity, S. 1819 sets this alternative energy cost equivalent at $32 per barrel of oil equivalent. Thus, if the "conservation price" (i.e., the price at which the energy saved by the project would have to be sold in order for the taxpayer to realize a 15 percent real rate of return) exceeds $32 per barrel of oil equivalent, the incentive would not be granted because the cost of the conservation to the nation is in this case too high. In contrast, if the conservation price is less han $32, the incentive would be granted but only to the extent necessary to produce the 15 percent real rate of return.

To summarize, Mr. Chairman, S. 1819 merits support for three reasons.

First, the availability of any incentive is conditioned upon the presence of quantifiable energy savings per unit of production.

Second, once the energy conservation potential of a particular project has been established, the incentive is available only where the project will not otherwise produce a 15 percent real rate of return on the investment and then the incentive is available only to the extent necessary to produce that rate of return.

Third, the actual granting of the incentive is in all cases tested to assure that the energy savings to be realized by the nation from the project have been obtained in a timely and cost effective manner.

Mr. Chairman, let me now illustrate the impact of S. 1819 by reference to four actual energy conservation opportunities that exist in our company and are described in Exhibit 2. These are projects which are cost effective from the national standpoint since the energy savings they represent can be obtained for smaller cost than would be required to produce equivalent amounts of energy from alternate sources; however, in some cases they are not going ahead because they are not

economical. For instance, let us take a look at Project 3 which produces a 22 percent savings in electric energy. The capital required to implement this project is $360 million. The return on investment is 6.9 percent, which is much below our minimum hurdle rate. The conservation price, shown in the second to last column, is $20 per barrel of oil equivalent. This is the computed cost of producing the energy savings and therefore, can be compared directly with the cost of producing equivalent energy through alternate sources. The threshold barrel of oil equivalent price (the "alternative energy cost equivalent" under S. 1819) which is shown in the last column, is the cost of producing an alternate source of energy, which S. 1819 sets at $32 per BOE. Thus, the energy saved by Project No. 3 would be cost effective because it is cheaper than producing equivalent energy via alternate energy sources.

As you can see, the return on investment for Project No. 3 is too low for us to implement this project without incentives. Conversely, Project No. 4 shown in the exhibit is already cost effective to us since it has a return on investment of 40.3 percent. Even though Project No. 4 is also cost effective to the nation (the conservation price is $2.78 per BOE, much below the threshold price of $32 per barrel of oil equivalent), this project should not get incentives because it is economically attractive without incentives. In fact, this project has been implemented.

From this exhibit, it can be seen that S. 1819 draws the very types of distinction that should be drawn for industrial energy conservation incentives. It channels the incentives into the energy conservation projects which need a boost to become economically viable and it would produce substantial energy savings in the near term. It provides the maximum energy savings for dollar of incentive. It is therefore worthy of support as part of an effective short-term energy strategy.

We appreciate this opportunity to appear before the Committee and stand ready to respond to any questions you may have.

EXHIBIT 1

INDUSTRIAL ENERGY CONSERVATION POTENTIAL

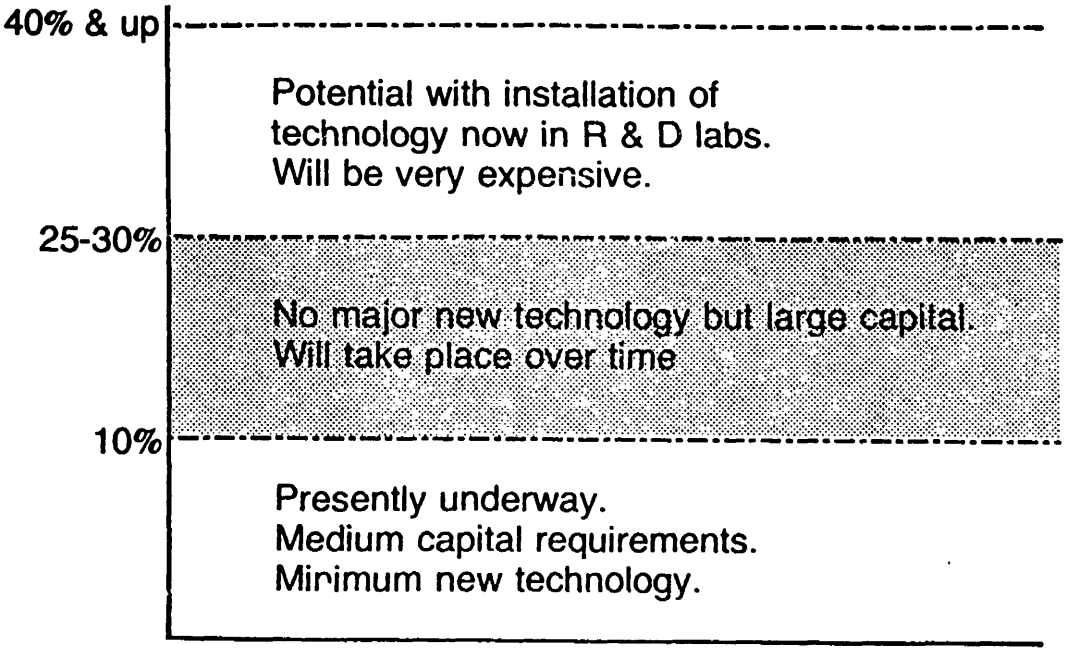

EXHIBIT 2

	Fuel Saved		Capital	ROI	Conservation Price	Threshold Price
	%	Type	MM Dollars	%	$/BOE	$/BOE
Project 1	15.4	No. 2 Fuel oil	4.3	14.9	14.34	32.0
Project 2	30.0	Gas	31.4	6.1	27.03	32.0
Project 3	22.0	Elect.	360.0	6.9	20.0	$2.0
Project 4	15.0	Gas	1.0	40.3	2.78	32.0

Senator WALLOP. Mr. Chairman, I certainly appreciate your courtesy in allowing me to share your hearing with you on my bill.

Senator BRADLEY. It is always a pleasure to share the platform with you, Senator Wallop, particularly when we have the same approach in different sectors.

Senator WALLOP. Yes; they are very compatible.

Senator BRADLEY. I think so, too.

Thank you very much.

The hearing is adjourned.

[Whereupon, at 5:05 p.m., the committee adjourned, subject to the call of the Chair.]

[By direction of the chairman the following communications were made a part of the hearing record:]

STATEMENT OF CONGRESSMAN JOSEPH L. FISHER

Mr. Chairman; I would like to thank the Committee for affording me this opportunity to express my interest in one of the subjects which I hope will be discussed by this Committee as part of its deliberations on tax incentives designed to encourage the development of alternate sources of energy. As a member of the Ways and Means Committee, I am sure than I will be engaged in a similar exercise in the near future.

The alternate source of energy of which I speak is co-generation. By this process, both electricity and steam could be produced from a single heat source. In doing so, there is the potential for significant energy savings as compared with our current methods of producing electricity or steam. Now, I would not pretend to suggest that co-generation will by itself solve our energy supply problem in the 1980's. However, it does offer the promise of making a significant contribution toward this goal. It is important to remember that, practically speaking, this goal will only be reached as a result of this and similar contributions, which taken together would help form a comprehensive plan for utilizing alternate fuels and methods for energy production.

I would urge the Committee to consider and debate the issue of co-generation. I believe that such a discussion would be consistent with what the Committee has done thus far in considering tax credits to encourage energy production from coal based synthetic gaseous, liquid and solid fuel, from thermal power, and processed wood fuels, and from gas produced from Devonian shale, coal seams and geopressurized brine. I believe that such a broad spectrum approach represents wise public policy. Over the next few years we must be wary of tying ourselves too closely to a limited number of energy sources, technologies or modes of financing.

I would further urge the Committee to debate co-generation during its current deliberations because I am confident that the Ways and Means Committee will be looking into this issue as part of its "Phase III" discussions on utilizing the revenues generated by the windfall profits tax. I, myself, am considering offering an amendment during these Ways and Means deliberations which would provide a tax credit for co-generation facilities. If the Ways and Means Committee were to pass this amendment or one similar to it, I believe that Conference Committee consideration of this aspect of any final energy bill would be facilitated if the Finance Committee had also during its deliberations debated this subject so that its members were thoroughly familiar with the arguments pro and con.

It is for these reasons that I hope this Committee will be able to include co-generation on its agenda and actively consider it.

Again, I would like to thank the Committee for its time.

ARIZONA PUBLIC SERVICE CO.,
Phoenix, Ariz., September 26, 1979.

Mr. MICHAEL STERN,
Staff Director, Senate Committee on Finance,
Dirksen Senate Office Building, Washington, D.C.

DEAR MR. STERN: Arizona Public Service Company, an investor-owned combination utility serving 11 of Arizona's 14 counties, desires the opportunity of comment on a proposed Residential Energy Efficiency Plan now before the Senate Committee on Finance.

Let there be no misunderstanding as to the position of Arizona Public Service Company relative to conservation and load management. Our company has pursued an aggressive policy of conservation and load management for our customers for some time. As a result of these efforts, an estimated 258,000 KW of demand has been trimmed from our current peak load forecast. Many millions of kilowatthours have not been used as a direct result of our efforts to assist our customers in conservation and load management. We are strongly in favor of programs designed to promulgate cost-effective reductions in the amount of energy consumed by our customers. Such proposals must, however, meet reasonable tests of practicality and cost effectiveness. A careful review of the "detailed explanation" of the proposal now before the Committee leads us to conclude that the Residential Energy Efficiency Plan does not meet these fundamental tests.

Prior to a consideration of such comment, we should like the Committee to take notice of the extremely limited time afforded interested parties to analyze, evaluate and prepare information on the proposal which would be of value to the Committee. In the case of Arizona Public Service Company, such notice took the form of a Press Release numbered H-62 issued by the Committee on Thursday, September 20, 1979.

Arizona Public Service Company received Press Release number H-62 at our offices in Phoenix, Arizona, on Wednesday afternoon, September 26, 1979. Our receipt of the document was not only after the deadline for requests to testify had passed, but after the hearings held that day had been concluded! The result is that we were left but one working day to prepare our written comments.

Notwithstanding the much abbreviated time allowed for comment, the proposal, as outlined in the one page "detailed explanation" appended to the Press Release, suffers from immediately apparent, fundamental and potentially fatal flaws in the areas of consumer protection, basic economics and sound energy policy planning.

With specific reference to consumer protection, of the several areas worthy of comment, the most notable is the fact that the proposal grossly misrepresents itself to the consumer. The consumer is told that the retrofits performed by the "private energy conservation companies" will carry no cost to the homeowner. Rather, "assessments" would be levied on the local utility based on the value of the energy saved by the improvements. Presumably, though nowhere documented, the value of the energy saved would equal the cost of the improvements. The deception of the consumer takes place when the statement is made that: "The utility companies would be permitted to pass these assessments through to the utility company consumer." Thus, the consumer is told that the improvements will be made free of charge when, in fact, a charge will be levied through his utility bill. Such misrepresentation cannot and should not go unnoticed by the Committee in its deliberations.

The consumer is again left to blind faith when the statement is made that the "contracting agency will *negotiate* with the successful bidder to pay a predetermined price for energy actually saved by the conservation company." [emphasis added.] The consumer, who ultimately will pay the cost through the utility bill, has absolutely no guarantee that the "negotiated price" will bear any relation to the *actual* value of the energy saved.

Further, there is no consumer protection afforded by the proposal against the installation of retrofit equipment of improvements by the private energy conservation companies which may well save energy but which are clearly not cost-effective. For example, the installation of a retrofit, solar powered air-conditioner in the Phoenix area would most assuredly save energy but by any cost-effectiveness standard, be it simple payback, life-cycle costing or present value analysis, the large first costs of the device argue convincingly against its installation. The proposal would permit, even encourage such uneconomic retrofits thereby enormously inflating the "negotiated" value of the energy saved, hence the utility assessment is inflated and finally, the consumer's energy bill. We wish to draw to the Committee's attention the fact that the bidding procedure outlined in the "detailed explanation" leaves the consumer totally unprotected against ultimately being charged a price for energy saved which far exceeds any real approximation of its actual value. The contracting agency is given absolute discretion in the solicitation of bids to include on a list of retrofit items noncost-effective equipment or improvements which would save energy. The negotiations which would subsequently take place with the successful bidder would, then, necessarily include these items as a major determining factor in the price of energy saved to be paid to the successful bidder.

The dilemma is this. In order to secure bids, some scope of work must be outlined to the prospective bidders. In other words, the contracting agency must say, in effect, "Are you available to do the following things: (1) conduct an audit, (2) cause to be installed any or all of the following energy-saving measures, and (3) negotiate a price for the energy saved by such installation?" If the contracting agency is not

specific in the work it wishes to be done, there will be no responsible private energy conservation companies bidding. If the contracting agency is specific in its scope of work, the absolute discretion allowed that agency permits the inclusion of uneconomic energy saving items on the list and the "negotiated" price used to cover those costs. If the contracting agency is not specific in its scope of work, no responsible private energy conservation company will apply.

In the latter case, if a firm were to bid on an unspecified scope of work, how is the contracting agency to assure itself and the consumer that the firm is both capable and qualified? In any event, the consumers' interests are placed in severe jeopardy by the proposal before the Committee.

The proplosal is further flawed from a practical frame of reference when it specifies that the contracting agency will conduct both "'pre and post' retrofit audits to determine how much energy the conservation company actually saves." This segment clearly indicates the need for three separate and distinct on-site audits: one by the private energy conservation company before retrofit, one by the contracting agency before retrofit and one more by the contracting agency after retrofit. While the cost of the private company's audit presumably will be recovered through the negotiated price of energy to be saved, there is no provision in the proposal to cover the cost of the two audits required of the contracting agency. If all of these costs are included in the price of energy saved, it is readily apparent that the ultimate price will exceed its actual value.

Further, another unacceptable dilemma occurs in the actual calculation of how much energy is saved. Such measurements are difficult at best and cannot be accurately rendered on a short-term basis. The "improved" energy performance of a home must be compared against its past consumption history. This simply means that after having retrofitted the home, its consumption must be monitored throughout all four ensuing seasons of the year to arrive at a reasonable comparison of "before and after." Even with such monitoring, accurate comparisons are difficult at best. A more/less severe winter, a more/less severe summer, a change in family living habits, the addition or deletion of energy consuming appliances, illness, a new birth are just a few of the variables which can alter a home's energy consumption levels. Thus, if the post-audit is done in the short term, the estimated amount of energy saved is a semi-informed guess. Even a long-term monitoring program can be unduly influenced by variables clearly outside the ability of the contracting agency to isolate and identify. In addition, if the long-term monitoring approach is selected, the private company could not receive payment for its work until the final estimate is rendered. As a consequence, carrying charges on the private company's investment in improvements would have to be covered, presumably through the negotiated energy price.

Therefore, if payment is rendered on the basis of a short-term post-retrofit audit, it may well not reflect the actual energy saved. If payment is rendered on the basis of a long-term post-retrofit audit, while the estimate may be more accurate, it will, of necessity, have to include carrying charges on the private company's investment in the home. In the first case, an inaccurate estimate is rendered. In the latter case, the cost of the energy saved will again be above its actual value. Energy conservation estimates are very difficult to render with the kind of precision demanded by this proposal. We urge the Committee to weigh carefully the potential danger in the disbursement of millions of dollars on the basis of such an inexact science.

The proposal outlines a procedure whereby the contracting agency assesses the local utility for "payment into the fund based on the value to the utility company of the energy saved from the retrofitting program." This value is determined by the contracting agency and would be "measured by the marginal cost of the fuel or capacity it displaces." We respectfully submit that there are any number of ways in which a calculation can be made. Each method will produce a different result, and the differences can be dramatic. For example, will the marginal cost of fuel be assessed at system peak or on system average? The difference in cost might then be oil as peak fuel and coal or nuclear as the vastly greater percentage of the system average or a fuel cost of something in excess of $3.00/million BTU for oil on peak vs. a base loaded coal plant with a fuel cost of approximately $.50/million BTU. The point is that the term "marginal cost" requires much, much more specificity before the Committee can make a fully informed judgment on the merits of this proposal.

We wish to emphasize, in closing, the unbending commitment of Arizona Public Service Company to conservation and load management. Our programs have been designed to produce maximum results a minimum cost to our customers and have successfully produced results which not only reduce energy consumption but, more importantly for APS and its customers, reduces peak demand in a time of runaway construction costs for new facilities. We would be pleased to enthusiastically support

legislation which would assist in furthering our efforts. Unfortunately, the proposal now before the Committee is sufficiently flawed in matters of practically and cost-effectiveness as to preclude such support. We would, therefore, urge the Committee to order further study and development of the proposal before it acts upon it.

Respectfully submitted.

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